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Original Articles

VARICOSE ULCERS OF THE LEG; CAUSES, COMPLICATIONS AND CONSERVATIVE TREAT- MENT.*

JOSEPH VAN BECELAERE, M.D., LL.B.

DETROIT, MICH.

Before proceeding with the subject of this paper I wish to offer you an explanation of the particular "ology" I shall use. Those among you who remember their classics, readily will trace back the term "hekologist" to the Greek word "helkos," an ulcer, while the others are liable to shy at the very first syllable that sounds like..... well, I won't tell you what it sounds like, on account of the ladies. (God bless them!) whom it will no doubt remind of the Kaiser's place of ultimate consignment.

In the course of my voluminous reading I have come across the statement that a good medical paper is not so much that one describing a clinical curiosum nor yet a therapeutic novelty as that which brings to mind clinical facts neglected, overlooked perhaps or even forgotten. Let this be my sole excuse for opening up today before this meeting on a subject so threadbare as that of varicose ulcers of the leg.

It has been said of Woman, as an entity, that she is of infinite possibilities, and that "the more you study her, the less you know her."

Now, since on the one hand "Mankind embraces Woman," both properly—and sometimes improperly—and since on the other hand Infinity constitutes one of the divine attributes, I hold that Woman's infinite variability constitutes the best proof of the "Divine origin of Man."

This elusiveness of Woman, as sex, applies in a large measure to varicose ulcers, with the saving clause however that while Woman, *per se*, constitutes a hopeless problem, diligent, pertinacious application to the study of varicose ulcers may bring a modicum of understanding of the subject.

Another occasional similitude to "the female of the species" is that a varicose ulcer is "a stubborn fact," a very stubborn fact, bounded on the north by varicosis, on the west by parastasis, on the south by kataptosis and on the east by therapeutic inefficiency.

All the slides in this series were made from original photographs taken by the author with the same hand-camera, at the same distance, so that the prints afford correct data for dimensional comparison. All patients were healed in due course of time, except one case of septic ulcer of long standing, in an alcoholic, age 32, who died of intercurrent pneumonia at a time when his lesion was more than three-fourths healed.

The term "healed" is used advisedly: Because the lesion has obliterated, patient is not in reality "cured," insofar at least as the possibility of recurrence is concerned.

None of these patients were necessarily confined to bed while under author's care, the entire plan of treatment being directed toward "keeping them in circulation."

Varicosis is the result of permanent dilatation of the veins, kataptosis the downward trend of liquids in the leg; parastasis the stagnation

of these liquids, and therapeutic inefficiency the consequence of poor clinical differentiation. Without intentional pun we may define an ulcer, taken as a *whole*, as "a tegumentary loss of substance that fails of normal repair." The lesion must be tegumentary, that is to say affect



A case of marked kataptotic infiltration, without apparent varicosis, ectasis being entirely of the interstitial or deep variety. Entire leg infiltrated, deformation reaching from garter to toes. Compare both legs as to size: left one appears almost twice the size of its mate.

Pigmentation affects entire lower half, and is less marked over the crest of the tibia, because here the intimate adhesion between skin and underlying aponeurosis prevents extensive deposit of hemochrom. Actual dermic lesions are of comparatively insignificant import.

a surface normally covered with epithelial investment, as for instance the leg, the gastric mucous membrane, the cornea.

Where the healing process begins immediately after occurrence of the lesion and proceeds uninterruptedly to complete repair, there can be no talk of "ulceration," since—however tardy

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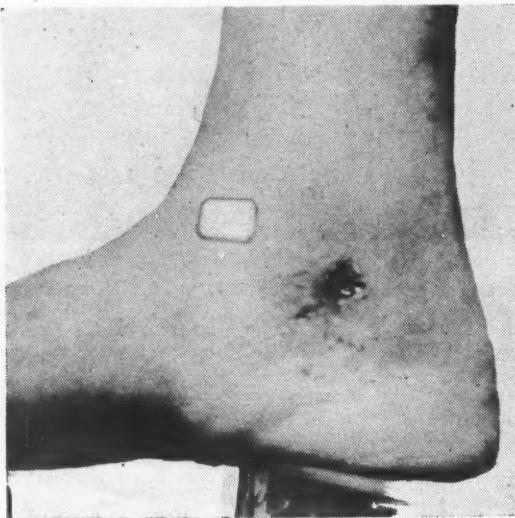
the healing—we lack the primordial requisite of chronicity.

Ulcers have been variously classified:



The pre-ulcerous stage in "ankle sores." There is marked permanent dilatation of the safena magna at ankle, and the post capillaries at inside of foot, along the sole. Large venous convolute covers ankle area, and dermatosclerotic submalleolar tissues are corrugated, retracted, almost cicatricial in character.

Extension and accentuation of this process gives rise to what I have called "cicatricial racemations," veritable interstitial cicatrices of non-traumatic origin. Inflammation of these foci may be followed by an ulceration that heals only when the entire fibrous mass has undergone sphacelous elimination.



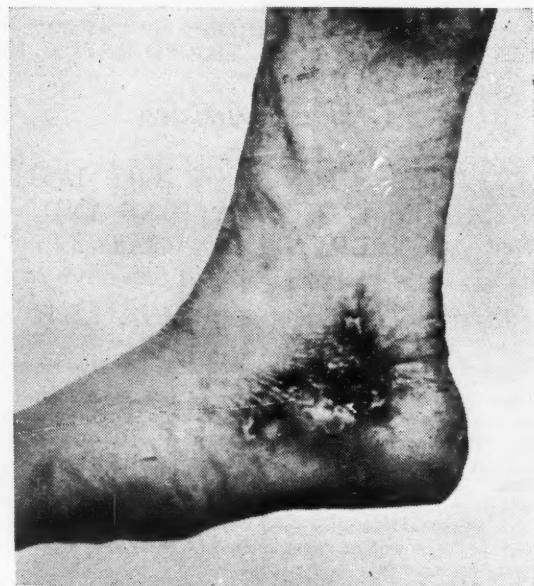
This represents one of these ulcerations in process of development. Note the absence of obviously dilated veins, the corrugation of peripheral margins, especially at lower and anterior edges of lesion.

1. According to location: ulcers of the leg, of the stomach, the cervix, etc., regardless of pathogenesis.

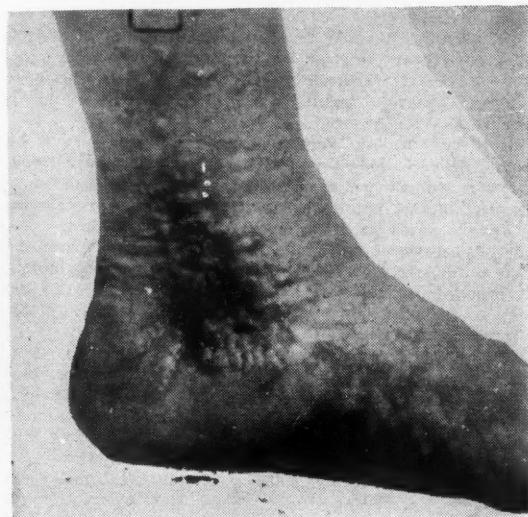
2. According to cause: venereal, varicose, herpetic ulcers, for instance.

3. According to some prominent (often immaterial) characteristic: verminous, callous, gangrenous, putrid, phagedenic ulcers, etc.

The one, single, main, ever present essential



Another case of the same nature, farther advanced. Here we have venous dilatation of the safena magna and tributaries, more marked than in the preceding instance. Note especially the tenuity, wrinkling and immobility of the marginal structures, bound down by the dermatosclerotic process.



In this patient, while the actual erosions are less obvious they have extended over a larger surface. Here again the affected skin is almost comparable to coarse grained morocco leather.

of the truly ulcerous lesion however, is a tendency to indefinite persistence, despite of, perhaps even *because of* therapeutic interference.

By reason of its enormous clinical preponderance that form of ulceration, hinging upon vari-

cosis, and which occurs at the leg, has become the prototype of its kind, so much so that not only the laity but also many of the profession at the mere mention of an ulcer visualize the typical varicose ulcer of the leg. Still a mo-

protean form, offset only by multifarious variations of incidence; the tubercular variety possible of quite as many vagaries; the scrofulous tegumentary lesions occurring in the most unexpected places, and so forth.

Of all the many clinical names in use none perhaps is so pregnant of meaning, so well chosen, so completely sufficient as the one under consideration, for condensing in two words both the name and the pathogenesis of a disease; A varicose ulcer: an ulcer complicated with



While this is not a typical case of cicatricial racemation I have introduced it in this series on account of its peculiar location—almost on the heel—in the post-malleolar zone.

The bulging at lower edge of calf is due to the presence of a large convolute of subdermic varices. Note moreover the venous dilatation parallel to the edge of sole, below the lesion proper.

Site and character of this lesion affords a transition to the typical varicose ulcers that follow.



This is a fine example of the single, inflammatory, paramalleolar ulcer, occurring in a patient bearer of deep varices, and without apparent phlebectasis or dermatophytic changes. Persistence of the dermic peninsula gives the lesion an apparently "horse-shoe" tendency, tho there was no trace of lues in the case.

ment's reflexion will recall many other kinds: the syphilitic ulcer for instance, of numerous



This is an atonic varicose ulcer in which the parastasis extended from garter to toes. Instep almost obliterated, despite fact that photo was taken after application of first antistatic dressing, as witness the impress of antistatic deligation.

Patient was a bulky, sloppy farmer-wife, and lesion alive with maggots at the first dressing.

varicosis, whether as a causal factor as commonly believed since before the days of Hippocrates, or as a consequence of the lesion, as held by J. L. Petit (1837), Benj. Bell, Underwood, Everard Home, Vidal de Cassis, Clerc (thesis 1841) and Jousseau (1852), I shall not here attempt to determine.

Like all other forms of ulceration, the primary cutaneous varicose lesion is the result either of a traumatism or the consequence of an



This ulcer of distinctly varicose type is complicated with marked dermatrophic changes at the inner ankle, lower half of leg. Varicose ampullae distinguishable along safena magna, as also the tendency to develop areas of agminated pigmentation, especially over instep, and in retro-malleolar space. The marginal edges are callous, fundus relatively smooth, and there is entire absence of exudate on the surface.



Another instance of extensive callous ulceration covering entire ankle region. Fundus pale, lardaceous, edges cartilaginous, lipped, marginal wall obliterated and merging into fundus proper. The remaining, persisting dermic peninsulae were precious factors in ultimate healing.

endogenous pathologic process, a thrombosing varicophlebitis. In the first case the wound, large or small, does not undergo the normal processes of repair; in the second it occurs as a sequel to pre-ulcerous conditions, themselves consequent upon kataptosis, and which materialize in the form of dermatites, eczemata, various dermatoses, and most often as a capillary thrombophlebitis, which after coalescing with the superincumbent derma, ruptures by disintegration of the vessel wall and becomes ulcerous.

Under the stress of continued unrelieved kataptotic pressure the fundus of such a lesion



In this instance we notice an enormous degree of parastasis, a veritable elephantiasis limited however to the foot and instep. Lesion in this case completely circled the leg above the ankle region.

Observe the thick marginal wall in post-malleolar region, and especially the "bagging" of the skin above ankle. This is not due to edema but to hard, brawny infiltration of kataptotic nature, constricted below by pronounced sclerosation of the marginal rim. The disposition of draperies tends to mask this feature, the leg at lower edge of calf is almost twice as thick as at the calf proper.

undergoes molecular gangrene, sloughs away and becomes infected; the marginal edges further break down as the result of trophic disturbance and impaired nutrition, and the fundus, extending in depth and surface, at last acquires the dimensions shown in some of our illustrations.

I do not here propose to conduct you into speculative pathogenesis, nor shall I fatigue your attention with detailed pathologic minutiae, how, for instance, the development of mesophlebitic plaques hinges upon a deposit of bacterial alluvia, even though the concept of mesophlebitis, occurring as a terminal metastasis of focal infection, opens up a most promising field of pathogenic speculation.

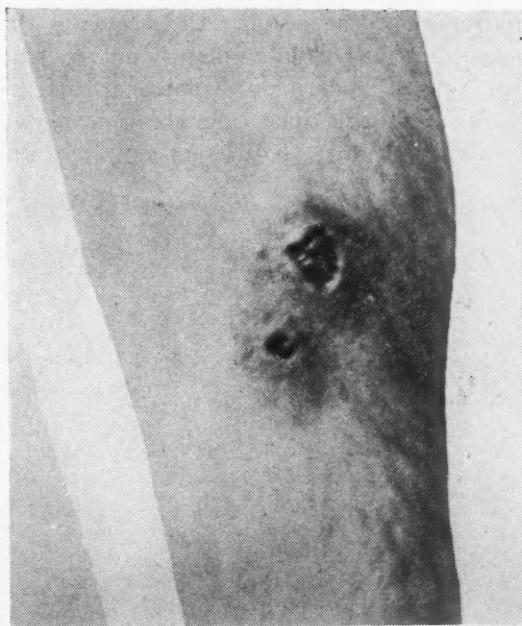
As to the possible complications of varicose ulcers of the leg, their name is legion, for in this field we meet up with the whole gamut of pre- and para-ulcerous conditions; the various



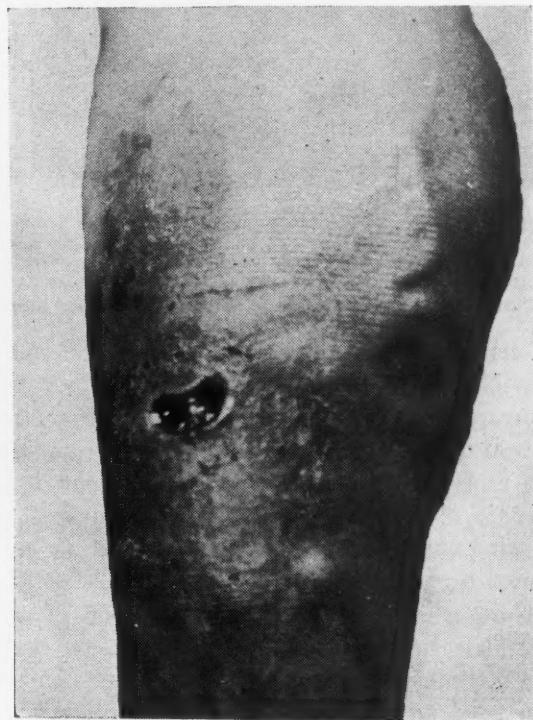
This slide presents a distinctly septic ulcer of long standing in a poor devil who by reason of matrimonial difficulties had for a long time persisted in seeking solace in the "flowing bowl." A heavy drinker as already stated he fell an easy victim to double pneumonia after spending most of a hot afternoon lying on the cool grass.

Note the thick, almost turgid, condition of the projecting peninsula, and the fundus bulging over the tibial crest on account of underlying hypertrophic osteo-periostitis. Cicatricial retraction at the upper border of lesion evidently interferes with circulation. Pigmentation, and especially congestion, reach up to the region of the garter.

dermic, vascular, nervous, periosteal and osseous complications featuring the sequelæ of underlying varicosis. An exhaustive consideration of all these would lead us too far afield, and I shall therefor limit myself to the cursory mention of those complications interfering directly



Here we have an interesting, and rather uncommon condition, an ulcerated thrombophlebitic ampulla, in which the adherent, overlying derma was destroyed and the fundus of the lesion constituted by a central vascular wall. The small adventitious lesion, below, is of little clinical import. At first blush the case might be considered as hætic on account of its peculiar location high up on the leg, and the apparently complete absence of typical varicosities.



This patient presents obvious distension of the safena magna, and a dermic infiltration of quasi edematous character, as witness the impress of elastic stocking worn at his first visit.

The comparatively small dimensions, thin, lipped edges, scant peripheral pigmentation, scarlet fundus and absence of exudate all point to the inflammatory character of this lesion. Incidentally, let me emphasize the mistake of wearing elastic hose over an open lesion.

with repair of the lesion. Chief among these are complications of inflammatory nature, which in the light of modern pathogenesis are attributable to septic infection: inflammation, erysipelas, angioleucitis are no different here than when



Here we have an instance of typical inflammatory lesion of katapotic nature. The varicose syndrome is exiguous, and mostly of interstitial character. Inflammatory congestion is limited to the immediate periphery, and there is remarkable absence of exudate at the surface of a rather irregular, hummocky fundus.

occurring in other wounds, and in the main possible of the classic treatment. They are comparatively rare of incidence however, for ulcerations are providentially immune to sepsis, and when inflammation *does* occur in a chronic ulcer, it is really in the nature of "a blessing in disguise," often stimulating and activating the reparative process.

Hemorrhage is due to an extension of the ulcerative erosion to some ambient vessel-wall, and is almost always of *venous* origin. (In the course of an experience extending over thirty years, and including more than three thousand cases, I have never met with a truly *arterial* hemorrhage.) Elevation of the leg and firm local compression are always competent to cope with the difficulty.

Septic thrombophlebitis is generally confined within a vascular segment obliterated at both

ends, and if *suppurating*, runs the usual course, and requires no more than the treatment indicated in localized abscess. Suppurating endophlebitis of the *patulous* vessel however constitutes a chapter in itself, and its consideration would lead us beyond the scope of the present paper. Nor shall I detail the various parulcerous conditions, the polymorphous dermatides: eczematous, ecthymatous, erosive, etc., the study of which really belongs in the domain of underlying parastasis.

Of all complications incident upon varicose ulcers of the leg, *hyperesthesia* is perhaps the most distressing and for the relief of which patients are at once most clamorous and most profoundly grateful. While excessive tenderness may develop in an ulcer wherever situated, it is perhaps more distressing and less amenable to relief when affecting a lesion of the para- or submalleolar regions, and such "ankle-sores" have at times given me no little concern.

Anatomically the pains may be due to direct *involvement of the nervous elements*; neuralgia, neuritis, interstitial varicosis of the nerve itself, or to *septic infection* of the fundus proper, and especially of the periulcerous tissues.



Another instance of an inflammatory lesion, recurring for the second time in exactly the same place, and with the same outline as at first. This would tend to show that the configuration of any given ulcer is not a mere caprice of nature, but a consequence of certain unknown factors (circulatory, neurotrophic or others).

Patient shows no superficial varicosity, and is powerfully built.

The zone of congestion is quite broad and appreciable, and in the main follows the outline of the lesion proper.

Here again irregular contour and atypical site of the sore might induce an erroneous diagnosis of luetic origin.

There is another form of ulceration, however, which is preeminently possible of hyperesthetic complications: I mean *that one* based upon the necrobiotic disintegration of interstitial dermatosclerotic foci.

Patients affected with long standing varicosis often present in the paramalleolar zones veritable close-meshed reticula, or even solid plaques of intradermic cicatricial formation, independent of any previous ulcerative process, and liable to endogenous infection from the accretion of blood carried bacterial deposits. Subsequent inflammatory changes occurring within or about such nodes of "cicatricial racemation," and predicated as they do congestion and infiltration of unelastic, inextensible structure give rise to most excruciating pain due to local mortification. Long before the stage of actual ulceration has obtained, patients are desperately clamoring for a surcease to their suffering. Hot

applications, (moist), increasing the local blood supply, and a recumbent posture with elevation of the foot above the knee level (thus combating the parastatic factor) are perhaps the most efficient means of relief at our command in this



In this patient the parastatic infiltration is enormous, as witness the crease in the skin above the heel. The large ulceration across malleolar region is due to coalescence of many smaller ones, with simultaneous persistence of dermic islands in the fundus. The multiple ulcerous at lower half of leg are evidently due to pyogenic infection of parastatically eczematous lesions. It is probably due to the existence of these numerous discharging exudates that we have here to contend with but a moderate degree of inflammatory congestion.



These extensive, varicodermic lesions of eczematous nature presented in a tall, spare-built man about 70 years of age. The upper dark area was more in the nature of a keratolytic lesion, probably traceable to decomposition of a lard-base salve applied by himself during an extremely hot spell of canicular weather.

period of the trouble. I have seen cases in which chloral hydrate internally, or the hypodermic use of hyoscine hydrobromate and even morphine were alone capable of controlling the patient. "Nerve blocking," so successfully used in oral surgery by my friend Dr. Charles Oakman, of Detroit, might perhaps afford relief in desperate cases, but I have no personal experience in the matter.

As soon as elimination of the sphacelus is initiated, and erosion of the tegumentary structures takes place, the indication arises for local anesthetics; hyoscine, cicutine, belladonna, hyoscyamine, morphine, opium, cocaine solutions, and the various synthetic substitutes for the latter; all these in powder form, or ointments of varying percentage. Cocaine is a two edged

sword, however, and while it relieves pain for a time, there is often a tendency to recurrence in aggravated form; and the use of the synthetic substitutes, orthoform especially, has been known to cause extensive subsequent sloughing in some patients; while to others it has proven to be a veritable God-send. There is perhaps in the whole field of helkotherapy no one condition requiring so much resourcefulness and adaptability as this very problem of coping with hyperesthetic ulceration.

Treatment.—As already stated a varicose ulcer is a tegumentary loss of substance, complicated with varicosis, which by reason of its resistance to the various means adduced for hastening its repair, truly deserves to be called "the bane of the profession." Innumerable topical applications have been attempted for its cure, and some day, when time lies heavy on your hands I should recommend a study of the compendious, though by no means exhaustive list of remedies enumerated by A. Winkelried Williams, in a most excellent and illuminating ar-

ticle published in the *London Lancet*, 1913, v. 2, p. 1015.

Always on a still hunt for specifics, the profession have attempted everything possible and impossible along therapeutic lines, the bolder,



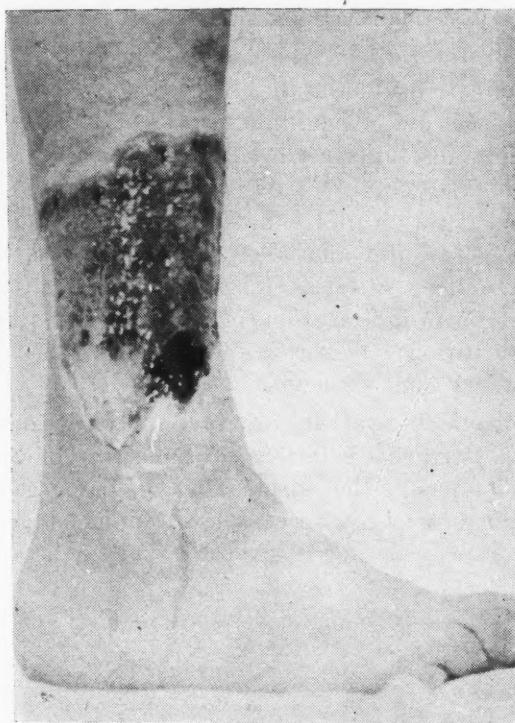
Here again varicosis was exclusively of the deep intramuscular type, the discoloration you notice, due to congestion more than to pigmentation. Edges of the lesions are thin, serrated, the marginal walls low, the fundi multiple, large, congested, but not waterlogged, or edematous. The diagnosis clearly points to a case of inflammatory varicodermatitis. Compare this lesion with the one immediately to follow.

Here you see a sore of an entirely different type: with thin, bluish edges, edematous water-logged fundi, no apparent kataprosis or obvious parastatic infiltration. The lesions are comparatively large, separated by wide dams of apparently healthy skin; the marginal edges narrow and evert: a fine example of scrofuloderma at the ankle.

more aggressive element—the surgeons—even seeking a radical cure by numerous operative procedures mostly rejuvenated from the dark ages. Mayo's operation, for instance, was performed by Oribasius, more than fifteen hundred years ago; Trendelenburg's is a revival of the procedure of Celsus; Madelung's method was practiced in the time of Galen, and Schede's operation is copied from Aetius, twelve centuries ago. Circumvalation of the ulcer, improperly called "circumcision," originated about the year one of our era with Celsus, and Rindfleisch's brutal "corkscrew cut," the spiral incision method, is but an extension and exaggeration of the incisions preconized by Abulcasim, of the Arabic school.

Nor shall I burden you with the numerous variations introduced at other hands.

To the surgeon who, perforce, keeps his patient in bed for weeks perhaps after his operation, the argument "post hoc, ergo propter hoc"



In this instance the chronic varicose ulcer has gradually encircled the entire leg, except for a narrow dam persisting at the calf, as will appear from the next picture. Perhaps on account of extent and relatively short duration of the sore, lesion having reached its present dimensions within a few years, abundance of discharges may have afforded adequate drainage and prevented marked parastasis. Note the almost normal "profile" at instep. Also the sphacelous area near lower edge of sore.

offers an almost insuperable temptation, and he sanguinely refers to his operative intervention the felicitous results that most probably would have followed simple, protracted recumbence in a horizontal posture He discharges—and promptly reports as cured—such patients as later come under my care with a recurrence, and sometimes an aggravation of their former trouble, disappointed, discouraged, disgusted perhaps at the futility of surgical intervention.

From statistical data collected by Görlich in 1904, in the surgical wards of von Bruns, of Vienna, it appears that in about 20 per cent. of Trendelenburg operations relapse occurred within two years, while a scant 4 per cent. of the patients remained cured after a lapse of from seven to ten years!

I remember off hand two cases occurring in my own practice, in whom the wounds made

by the surgeon, excising the veins, became ulcerous and failed of normal repair. Cases of this kind are the more stubborn for lacking their normal circulatory facilities, and are indeed a test of therapeutic efficiency. Incidentally I am able to report both as cured, without relapse, after the course of many years.

As for me, I have long since given up all attempts at curing varicose ulcers of the legs by excision of the veins. "Remove the cause and the effect is gone," says the proverb. Experience, however, has demonstrated—to my satisfaction at least—the fallacy of this dictum. Granted that obliteration of the varicose vessels causes a temporary suspense of kataptosis, unpreventable early dilation of collateral channels will unavoidably reproduce the former trouble, with the additional disadvantage of a surgically restricted return flow. A sick man contributes at least a modicum of labor, a dead one is useless. The same applies to the veins: though dilated, varicose, ampullar if you please, they'



This is a posterior aspect of the leg in previous slide. Entire circumference of the leg was ulcerated, except for this narrow strip of persisting skin. Observe the cicatricial character of integument at the wider, upper end of dam. The leg is half hidden, with patient reclining in bed. Some people never know when they have enough, and this patient sported another enormous ulcer at the inner ankle of the other leg.

still do some part of the work, while after their extirpation or obliteration the total onus falls on the few remaining vessels that have escaped the surgeon, and fail the sooner of their physiologic efficiency for having to perform so much additional work.



This slide shows one of my earliest patients. Tho the ulcer absolutely circled the entire leg, and had persisted for twenty years or more in this poor washerwoman, who had to rest her knee on a chair while standing at the tub, thanks probably to the large islands of derma persisting in the fundus, healing was completed in less than two months. As usually, this patient, once rid of her trouble, neglected proper precautions, and her leg broke open again, in the same place, manner and extent as before, but again healed quite as readily.

So that in order to be fair to ourselves and the patient we are in reality restricted to the use of local topical and physiotherapeutic means, for the treatment of varicose ulcers of the leg. Nor is this a confession of therapeutic indigence. Of course the less you expect from internal medication the smaller shall be your disappointment: Mercurials, (as recommended since Underwood's time), salines, purgatives, and quinine salts have no curative action on ulcers of the leg. Ichthylol, as introduced by Unna (Hamburg) and his followers, is perhaps the only medicinal agent still exhibited for internal treatment of varicosity and its sequelae; and its *perennial* use is claimed to cause regression of the dilated veins and varicose ulcers by simultaneous reduction of arterial pressure and increase in venous tone. (Nobl.) Tavel, of Berne, further advocates caffein as an adjuvant to local surgical intervention.

Treatment of the lesion itself is effected along chemical, physical and surgical lines. Mercurial salves and plasters, with or without addition of lead, often cause exacerbation of the lesion the more as eventual decomposition of their animal base tends to increased irritative manifestations.

Profuse discharges can be checked, and elimination of necrotic shreds activated, by the local use of liquid antiseptics: Goulard's or Burow's solution; alcohol, bichloride, $\frac{1}{2}$ per cent. resorcin or silver nitrate packs, under sheet gutta or oiled silk, soon overcome secondary germ life, and effect a cleansing of the granulating surface. When moist applications are contra-indicated or cause local irritation, the various dessicating antiseptic dusting powders come into use.

Atonic ulcerations are preferably cleansed with astringent solutions of alum, zinc or copper sulphate, the silver salts, or the organic astringents: $\frac{1}{2}$ per cent. sol. of tannic acid, etc. Hydrogen peroxide is efficient not alone through



One of my patients with hitherto unhealed operative wounds. Scars of former excisions obvious. These two lesions resisted treatment for months, and finally patient drifted into my hands. Tho there was no infiltration of the skin, kataptoisis was a dominant factor, and had to be overcome before a permanent healing took place. Note the pigmentation outlining incision scars, and the peculiar disposition of pigmentary deposits at ankle.

its mechanical influence as a "searching" cleanser, that penetrates all anfractuosities, but especially by causing local hyperemia and oxidization.

Under the head of physiotherapeutic means we have massage, hydrotherapy, hot air baking, carbon dioxid snow, (Pusey-Chicago), electrotherapy, phototherapy, Finsen's apparatus, the mercury vapor quartz lamp, radiotherapy, but most of all, effectual compression.

As to the local surgical procedures, aside from and independent of the unjustifiable excision of the varicose veins themselves, I shall mention deep lateral incisions (introduced by Lisfranc), circumvallation of the ulcer, excision of the marginal walls, curettage and excision of the entire fundus and dermoplastics operations after the methods of Reverdin, Krause, Thiersch, and Beck-Chicago.

Of all the plans of treatment advocated, graduated, methodical compression,—*antistatic*

deligation—has proven the most reliable, as well as the easiest of application. It must, however, be *competent* and *adequate*, in other words effect an appropriate contention of the leg, and control of the local circulation. Numberless patients have warned me that

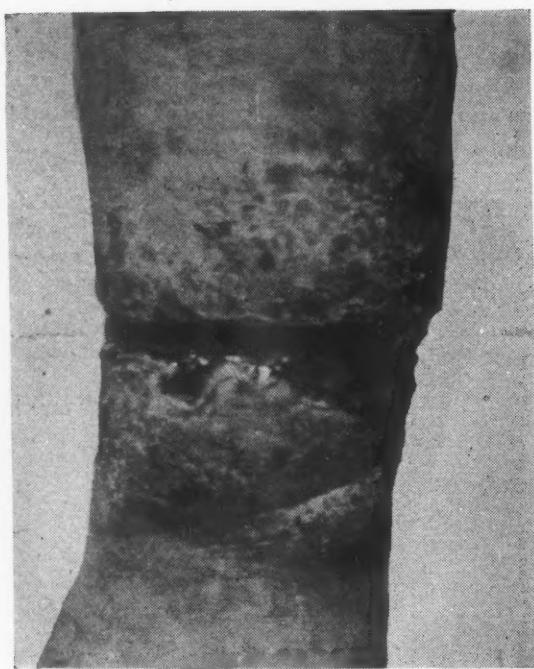


Judging merely from site and shape of lesion in this case one would most probably deem it of luetic origin. Still, on account of the atonic, anemic aspect of the fundus, the dermatothic periphery, the apparition of a scar ulcer at the upper corner, and especially the entire absence of any recognized luetic stigmata, patient underwent a successful cure by the antistatic, compressive method.

In this patient, affected with both deep and superficial varicosis, the dermic changes approximate the characteristics of dermatosclerosis; scant pigmentation, mostly at the peripheral portions; peculiar "hidebound" condition all around lower third of the leg; scar ulcer over tibial edge.

"no bandages stay put on their legs," that no sooner had they left the offices of doctors X. A. or Y., but their bandage was down about their ankle; that they could themselves do a better job of bandaging, etc. This goes to show that not even the greatest surgical skill will take the place of moderate technical achievement. Nor can this apparently trivial factor be slighted: either your antistasis and circulatory control are adequate and competent, the parastatic and kataptotic factors neutralized, and your topical application allowed to work to advantage, or else your *deligation* is inadequate, incompetent, and all your change in topical treatment proves useless. It is for having so long disregarded this essential feature in the treatment of ulceration that the profession have been led into the empirical use of thousands of disparate applications, ranging from zinc ointment to the local use of bovine amniotic fluid.

But whether we pin our faith to the use of adhesive strips as recommended by Baynton in 1799, or to the prehistoric roller bandage, the



This is an ulcer of another type, of what might be called the "girdling" or "garter" variety. Observe the marked infiltration of the skin, the overhanging upper edge, the depth of marginal wall, the trophic changes at periphery, both above and below the lesion proper.

The upper edge was almost cartilaginous in consistency, and the sore demanded energetic, protracted antistasis before it healed for good.



A companion piece to the preceding. Parastatic overhang beautifully marked at both points: calf and instep. Here the infiltration is most marked in the submalleolar area, and at the instep, where the skin is absolutely "leathery."

Note especially how the thick, shelving marginal wall over the instep, tends to merge into the fundus proper, and also the undercut appearance of upper edge below the calf.



Here we have an enormous, long standing parastatic infiltration. Note the pachydermatous, elephantastic condition of the skin, which is gray, corrugated, lichenified. The lesion, as in previous cases, extends practically all around the leg, only a narrow dam connecting the "sock" to the "legging."

Observe especially the thick, overhanging edges, both over instep, and below the calf; also the island of skin persisting in the fundus, and the large varix below the bend of knee.



This represents the largest hyperesthetic ulceration I have met up with to date, and occurred in a varicose multipara. The shallow lesion, probably due to eczematous varicodermitis, was gaining like wildfire. Note especially the new focus of recent occurrence in upper marginal edge, also the less typical one at lowest sector.

Treatment was mainly with orthoform new, locally, which providentially proved almost unirritating in this case.

one, certain, positive, unavoidable fact is that in order to insure success we must ourselves attend to the job, for as I have elsewhere stated:

"In helkology, more perhaps than in any other part of the medical field, it is attention to the small, unobtrusive detail, the desultory, evanescent clinical finding, that spells all the difference between complete, radiant success, and unheartening, dismal failure."

This above all—and it is a matter of world experience—see your cases early, the sooner the better, and attend to every detail *yourself*.

Lack of time compels me to confine my paper within the restrictions of a limited program: hours could be spent in the profitable study of reparative processes: cicatrization and epithelation for instance; of the various chorioplastic and keratopoietic agencies; of the numerous anaplerotic and epulotic applications, were it not for the limitations imposed by a program already crowded.

400 Dix Avenue.

TYPHOID FEVER.

A. R. HACKETT, M.D.
DETROIT, MICH.

STATISTICS SHOWING VALUE OF TYPHOID VACCINE GIVEN DURING THE INCUBATION PERIOD.

Number of Diarrhea Patients	142
Number of Patients given Vaccine	128
Number of Diarrhea Patients given Vaccine...	77
Number of Typhoid Patients	26 18-44/142%
Number of Typhoid Patients that had received Vaccine	4 5-15/77%
Number of Typhoid Patients that had not received Vaccine	22 33-55/65%

Note:—Of the 4 typhoid patients that had received Vaccine two of them had received two doses each, two of them had received one dose each. All four of these run very, very mild courses.

In presenting this paper I do not know that I will bring out any new points, or say anything that has not been said already about typhoid fever. My main object is to point out a few things that were of special interest during two

typhoid epidemics we were called upon to handle recently, one occurring in the spring and the other in the fall. In each case the typhoid epidemic was preceded by a severe epidemic of gastroenteritis which was directly traceable to the water supply and in this connection I want to point out the dangerous menace the contaminated water of the Detroit river is to those living near its banks, especially the towns farther down. In fact in the last three years, the hospital has not at any time been entirely free from cases of this kind.

In the spring epidemic there was something over 125 cases of gastroenteritis. They had the usual symptoms of sudden onset; vomiting, severe diarrhea and abdominal pain. These as a rule cleared up readily under treatment, but the nature of the infection led us to suspect that we might have to deal with a typhoid epidemic at the expiration of the proper incubation period. This proved to be the case and in the space of a few days, there were twenty patients admitted to the hospital suffering with typhoid fever. These all ran the usual course and all recovered with the exception of two; one dying from a complication of appendicitis for which he was operated and the other from hemorrhages.

In the fall epidemic about the same conditions occurred. Early in December, the first few cases of gastroenteritis appeared and for several days there were an average of eight to ten cases appearing daily for several days, gradually getting less in number as the days passed. These presented the same symptoms as those in the first epidemic and were treated in the same way. As a rule they yielded as readily as the first cases, but at the end of the same incubation period typhoid fever cases began to appear and in the space of a few days twenty-six cases were again admitted to the hospital. These ran a much more severe course and four of them died of complications as follows, two from hemorrhage, one from intestinal perforation in which operative procedures were refused and one from exhaustion following a severe diarrhea and delirium.

Having gone over the history of the epidemics briefly I want to take up and discuss a few points we thought were of value in the diagnosis, and the treatment of these cases, and to help in presenting this in a graphic way, I have had a few slides prepared, in place of the usual charts.

DIAGNOSIS.

Usually the diagnosis in these cases was comparatively easy to make. The history of having had the primary colon infection and the usual symptoms that occur during the onset, such as malaise, headache, backache and loss of appetite together with the elevated temperature, led us to the conclusion we were dealing with typhoid fever.

CHART 1. Chart one shows the percentages in which these different symptoms occurred during this period.

The next thing we found of most value in making an early diagnosis was the blood picture as shown by the next two slides, Chart 2 and 3. In all cases a total and differential white blood count was taken as soon as the patient entered the hospital. One of the interesting things we noticed was the uniformity of these counts and also that the polymorphonuclear cells were usually somewhat diminished with a corresponding increase in the small lymphocytes. This latter condition was exaggerated as the disease progressed. Whenever, during the course of the disease, the reverse condition occurred, it was invariably followed by some complication, such as hemorrhages, infections and so forth. We were of the opinion that this blood picture was of more value in making an early diagnosis, than the Widal, which in the early part of the disease is rarely positive and in some cases not throughout the whole course.

The next two slides, show the symptoms and complications met with during the course of the fever.

GENERAL TREATMENT.

Realizing that there is no specific treatment for typhoid fever other than typhoid vaccine—which in a measure can be considered a specific treatment for it, although its therapeutic value has not been established, the general treatment was chiefly careful dieting, hydrotherapy, vaccine, medicinal and treatment of complications as they arose. In securing a diet for these patients, considering the pathology encountered, it was necessary to secure bland, non-irritating substances and also to counteract the excessive oxidation due to the high temperatures by a diet of a relatively high caloric value which was increased as rapidly as tolerated.

CHART 6. The chart shows in detail the liquid diet given these patients. This had a caloric value of 1005 and represents in two hour feedings all and the only food given for

the first seven to fourteen days or until the abdominal distension no longer continued and the fever was coming down. As soon as it was thought advisable this diet was gradually increased for some patients by substituting an eggnog for the 10 A. M. and 10 P. M. feeding. For others it was changed to the increased diet which is represented on the next chart.

CHART 7. This increased diet contained the full liquid and the other articles as shown giving a total of from 1760 to 1782 calories. If this diet was well tolerated eggnogs or ice cream were added giving the caloric value as shown. Patients were usually kept on this diet for the remainder of the disease and only when the fever became normal were they increased to the soft diet.

CHART 8. In five patients, first coming into convalescence, a heavier diet than this soft diet was given which included potatoes, some other vegetables and a small amount of meat. In three out of these five patients, the temperature at once rose again. In one of them it seemed to have caused a relapse with a rise of temperature of about two degrees, which continued for fourteen days. We therefore felt it inadvisable to crowd any of the convalescents with anything heavier or more than this soft diet up to the time of discharge from the hospital, and they were then instructed to continue this diet for a week or two at home and add vegetables only very gradually. No more relapses occurred.

You will see by these selections, we were able to give a bland, non-irritating, readily digested diet. This diet threw the least possible amount of work on the intestinal tract and yet supplied a large amount of liquids which provided for the best of elimination. It also supplied a high caloric value, so that very few of these patients developed what was formally recognized as the characteristic typhoid state of great emaciation and weakness, but nearly all of them were in a state of fairly good condition when they left the hospital.

HYDROTHERAPY.

Used on these patients was that of sponging with as cool water as could be tolerated by the patient. First the sponge baths were given with water at a temperature of 80 to 90 degrees—gradually lowering it by wringing out towels in colder water down to 50 or 60 degrees. These sponge baths were continued for about 10 or 15 minutes—some of them 20 minutes. These were given every four hours, whenever the tem-

perature was above 102.6. Only in 1 or 2 patients did this routine form of hydrotherapy do some harm, and the bath was not well taken—such was indicated by increased restlessness, and discomfort after the bath. Most of them reacted very comfortably, giving the characteristic beneficial reactions from the baths, such as lowered temperatures, diminished restlessness, increased ability to sleep, which were expressions of a better elimination and consequent lower toxemia.

VACCINE.

CHART 9 and 10. Was given during the course of the fever to 16 out of 26 patients. These patients received the regular immunizing doses of 500,000,000 the first and 1,000,000,000 for the second and third doses—given from 6 to 10 days apart. In most of them it produces no appreciable rise in temperature or other aggravation of the symptoms. In a few of them there was a temporary rise for a half day of 1 or 2 degrees, with a subsequent fall of temperature and invariably on the second day after the vaccine was given, the temperature began to go down more rapidly than was usual in these cases. It never caused any untoward symptoms, but on the other hand were satisfied that it could well be adopted as one of the routine measures to be used in the treatment of typhoid fever.

MEDICINAL TREATMENT.

The only routine measure used was that of giving American Oil to nearly every one of the patients. The object in giving this oil was that we considered it had some slight antibactericidal qualities, chiefly in mechanically hindering the growth of the bacteria, also tending to coat over the ulcerated intestinal tract. It also provided for easy movements of the bowels, without giving any too increased peristalsis. It seems to be especially valuable when the patient complained of abdominal pains. It was then given in 1 or 2 oz. doses, twice a day.

SYMPTOMATIC TREATMENT.

For the diarrhea American Oil was given in from 2 to 4 oz. doses, followed by large doses of bismuth subnitrate, 20 to 60 grains, repeated two or three times. Salol was given in a few cases from 5 to 10 grain doses every 4 to 6 hours. In most of the cases these measures checked the diarrhea, however there were 2 or 3 of them with a very persistent and severe diarrhea in which tannigan was used to good effect.

CONSTIPATION.

Two oz. doses of American Oil were given twice daily. Where this was not sufficient, the dosage was increased to 3 or 4 oz. supplemented by cool enemas. These enemas were also used very frequently in controlling the fever.

FOR THE HEMORRHAGES.

There were two cases of fatal hemorrhages, which were checked up by blood counts showing an increasing anemia. These were given adrenalin and hypodermoclysis and intravenous saline. One or two of them that had repeated small hemorrhages, 1 or 2 every day, for a week or more, received calcium lactate, 15 grain doses every 6 hours.

DELIRIUM.

For the delirium hyoscine seemed to have some value. Delirium subsultus and nervousness seemed to be diminished after it. Chloral hydrate and morphine sulphate and morphine hydrobromate seemed to relieve the delirium only temporarily. In one case the delirium was very severe (No. 18). These temporary measures failed and he only showed improvement after he was given 1000 c. c. normal saline intravenously on three succeeding days.

DISCUSSION OF SPECIAL PATIENTS.

CHART 5. Patients No. 3, 4, 5 and 9 had one or two doses of vaccine before admission.

No. 3 had two doses of vaccine before entering hospital. His complaints were diarrhea, headaches and abdominal pain. He ran only a very slight temperature—his highest was 100. He ran this low temperature for 5 days while in the hospital. There was no enlargement of the spleen, and no typical rose spot could be seen anywhere. His blood count of Jan. 2nd was

Haemoglobin	95%
White	7140
Poly	70%
Large	1%
Small	25%
Eosinophiles	2%

The Widal never became positive.

No. 4—had received one dose of vaccine before entering. He complained of headaches, diarrhea, anorexia, malaise. Few rose spots could be seen. Spleen never could be palpated. He ran a fever for 14 days. He received the 2nd and 3rd doses of vaccine while in the hospital. He was never very sick at any time and recovered without any complications.

No. 5—had received two doses of vaccine before entering hospital. His highest temperature you will note was 101.5. He was only in the hospital for 6 days. Spleen never could be palpated. A few rose spots could be seen. His Widal was positive on Dec. 31st. His blood count on entering was:

Haemoglobin	95%
White	7100
Poly	74%
Large	13%
Small	13%
Eosinophiles	0%

No. 9—had one dose of vaccine before entering. He came in complaining of headaches, diarrhea, malaise and abdominal pain. He ran a temperature for 9 days—his highest was 103.5. Had a slight nephritis. His blood count on Jan. 5th was:

Haemoglobin	95%
White	7850
Poly	75%
Large	10%
Small	13%
Eosinophiles	2%

His Widal test was negative. He ran a very mild case.

Now taking up three patients who ran very severe courses No. 16 you will notice was sick for 37 days. His highest temperature was 105. He had bronchitis, anorexia, rose spots, diarrhea, abdominal pain, he had an enlarged spleen, he had a mild delirium, he had hemorrhages, and nephritis. He had many small hemorrhages. There were bloody bowel movements nearly every other day for the first 23 days of his stay in the hospital. During this time he was given calcium lactate in 20 grain doses, three times a day. Morphine sulphate was given. After the large hemorrhages he would sometimes be more restricted in his diet and would receive large doses of bismuth subnitrate.

Care had to be exercised to avoid too frequent movements of the bowels. For this reason enemas were given very cautiously and American Oil was used a few times in 4 oz. doses per rectum, giving very satisfactory results. His delirium was of a mild nature and called for no special treatment for that, and during his convalescence he seemed to dream a great deal and showed signs of a peculiar psychosis as is sometimes seen following typhoid fever, for about a period of two weeks when it all cleared up and showed no other symptoms.

CHART 11. This patient ran a very severe course. You will notice he ran his first course of fever for about 18 days, then had a subsequent relapse of 16 days. His pulse ranged from 75 to 140. His highest temperature was 106. He had severe headaches, anorexia, rose spots, diarrhea and abdominal pain. No spleen could be palpated on him. He had severe delirium and marked abscess formation.

DISCUSSION OF THE DELIRIUM.

This delirium was very severe. It lasted for 14 days, gradually becoming worse, so much so he was hardly able to take any nourishment. With it there was a marked subsultus, nervousness and restlessness. All the usual methods were used in trying to quiet the delirium, but they were all temporary until 1000 c. c. saline were used intravenously. After each injection the patient would become quieter and be able to sleep for an hour or two. He improved each day and later the third injection was given, he slept well probably 8 hours and was nearly entirely normal on the following morning.

The diarrhea that the patient had was very severe, lasting 30 days and this probably was one of the factors besides the toxemia causing his delirium.

The blood count showed an apparently high increase of the reds 5,280,000 on Jan. 14th, and on Jan. 26th, 4,900,000. Very likely a concentration of the blood was brought about because of the severe diarrhea, this producing a diminished circulation to the brain. By increasing the volume of the blood with the intravenous saline a greater nourishment of the brain was obtained and the delirium which possibly was caused by the diminished volume of blood as much as by the toxemia was greatly improved by the intravenous saline.

The diarrhea was very severe, all the usual methods which had been effective in the other patients, failed on him until a large dose of American Oil—about 4 oz. was given to him—followed by 6 grains of tannigen, repeated every four hours. Within 12 hours the bowels were under control and they never bothered afterwards, evidently tannigen had some real value in checking this diarrhea.

ABSCESS FORMATION.

He had a large abscess form on his right jaw. This seemed to be so deeply situated, that it did not seem advisable to try and open it from the outside and the exact point on the inside of his mouth could not be determined, so after 2

or 3 days with hot applications externally, it finally broke into his mouth and discharged freely. He also had 3 abscesses form on his left arm, at the usual site of giving hypodermic medication, during his severe delirium. These abscesses on his arm seemed to be well encapsulated and healed quite readily after being opened.

OTITIS MEDIA.

On this patient this called for the opening of both ear drums by Dr. Frothingham, they discharged freely for about 2 weeks when the discharging ceased and he had a good recovery. He also had two large strangulated hemorrhoids. It seemed inadvisable to open these for fear of losing more blood. Hot applications and bella donna ointment relieved him somewhat. After a week or two they had gone down to their normal size. We considered this a most unusual case of recovery for a severe typhoid with many aggravating complications.

The third severe case we wish to bring up is No. 21. This man had a course of fever for about 38 days, his highest temperature was 105. He had headaches, anorexia, rose spots, severe diarrhea, with severe abdominal pain; also a mild delirium. There was a question of whether he had or had not a perforation one afternoon. He also had otitis media and abscess formation. His Widal was negative when he entered the hospital probably would have been positive later on. This is a case where the blood count is of real value for diagnosing of the possible perforation and calling for the proper precautions to prevent a spread of the local peritonitis into a general peritonitis. Note blood counts for patient No. 21, especially note the count made on Jan. 21st where you have the marked increased amount of small lymphocytes to 42 per cent., on Jan. 24 you have the differential count changing to 75 per cent. poly, instead of 44 per cent., that meant an enormous increase of the polymorphonuclear cells with the small lymphocytes only 19 per cent. His total white was only 8200, probably due to a slight hemorrhage associated with it.

CONCLUSION.

One of the biggest lessons that we learned from these epidemics was the value of typhoid vaccine, during the incubation period which you will note by the statistics on the following chart (No. 12). From this chart we see that any patient having had diarrhea and receiving vaccine—his chance of getting the fever was

5 per cent., or 1 to 20—while if the patient had diarrhea and did not receive the vaccine his chance of getting the fever, as you will see was 33½ per cent., 1 to 3, for you will notice that nearly all the cases of typhoid fever came out of the group that had diarrhea but did not receive the vaccine 22 out of 26.

The second lesson we learned was the great value of the total and differential white blood count taken early in the disease also during the course in watching for complications.

Third—the value of American Oil in the routine treatment of these cases, and also the value of careful diet and of careful nursing.

DISCUSSION.

DR. W. M. DONALD, Detroit: I would like to preface my opening remarks. I could not quite catch the number of patients he had. I could not see the chart from where I was sitting.

THE CHAIRMAN: Fifty-two altogether, doctor. The experience Dr. Hackett has had is in the Delray Industrial Hospital. That is the occasion for his presentation of this paper. The up-river districts. The further you go down, the greater the existence of typhoid fever.

DR. DONALD: All these figures are taken from hospital records?

DR. HACKETT: A special epidemic, directly traceable to one source of infection.

DR. DONALD: Were there other patients suffering outside at the same time?

DR. HACKETT: No, sir.

DR. DONALD: Not only treated by you, but by other physicians?

DR. HACKETT: We treated all of them.

DR. DONALD: There were other cases?

DR. HACKETT: They were all brought to the hospital.

DR. DONALD: Could you trace it to the water supply?

DR. HACKETT: Directly.

DR. DONALD: I just want to get this clear. The history we have is 50 cases of this epidemic. Now, these men were incapacitated for altogether three months, gentlemen. A fourth of a year. Those men represent easily, in an economic way, wages of about \$1,000 a year. They represent in loss at least a quarter, \$250 at least, in wages lost. That, I think, would be the minimum. Fifty times 250 would represent the monetary value of their services lost to the community. Now, in addition to that, was the care of these individuals by the physicians and by the nurses and by the attendants. What did that mean? It meant that we couldn't afford to care for our sewage, but we could afford to pass it down to our neighbors along the river and let them drink our sewage. In other words, "Am I my brother's keeper?" Now, this beautiful city of Detroit answers, "No, we are not." Let Wyandotte, let Thornton look out for themselves. In other words, let the neighbor be damned. We dump our sewage into the river. Our neighbors drink our sewage with the tremendous economic loss which we have just heard.

That is the point that appeals to me always. It is not at all unanalogous to the condition of we physicians who exercise our best efforts in saving an occasional life and then we exploit the manufacture of a high explosive to kill thousands. And the futility of it all to me is particularly interesting and particularly fascinating from a psychological standpoint.

So far as this paper of Dr. Hackett is concerned, I think he has brought up several exceedingly valuable points. In the first place, the question of blood counts. I didn't catch the time it was recorded. What day did you get the blood count? What day of the disease?

DR. HACKETT: Ordinarily, that would be about the second or third day of the disease. The first week, anyway.

DR. DONALD: Of course, you can get a count earlier than that.

If the figures Dr. Hackett has given us are correct, that is exceedingly valuable, showing no high leucocyte count during the early days of the disease, as suggesting points before we can get a Widal. No blood cultures made, were there?

DR. HACKETT: There were some, but they were not very satisfactory. We did not get uniformity of results.

DR. DONALD: It might be valuable to test that out with some of our further epidemics. While we feel that is a thing of the past, it is not a thing of the past and we will undoubtedly have more of it.

Now, there is one thing that attracted my attention, and that was his method of treatment. I can recall how the bran treatment was taught to us as a *sine qua non* in treating typhoid fever. You notice the elimination of the bran treatment. I have not seen it at all lately. I have not found it necessary to use in the vast majority of my cases, but where the temperature has been very high or a very profound toxemia, it seems to have been a valuable method of treatment. It is dirty and cumbersome. In the house, it is almost impossible to achieve. We can, as Dr. Hackett did in his cases, secure almost as quickly and as good results by the wet pack and sponging and various methods of hydro-therapy.

I notice he spoke of colon lavage, in washing out the bowel, and also as a hydro therapeutic measure in reducing temperature and reducing toxemia, which, to my mind, is an exceedingly valuable method.

Years ago I instituted a series of experiments in the use of vaccines as a cure for typhoid. Our figures were very disconcerting. We did not get anything like the results that the doctor was able to get. Of course, his vaccine treatment was earlier in the disease. All of them, at least one injection before they came to the hospital. They either had the injection just before they came down with the disease or immediately after. Whereas, they came to us late in the disease and the result was practically nil. That, I think, is an exceedingly important point and a point that should be remembered and emphasized, so that if one is going to use the toxines, he should use them early. It should be considered a routine method of treatment where a case of typhoid lies in the house, that all other members of the household should receive vaccination just as in cases of smallpox, when one case is in the house, vaccinate all members, and with diphtheria in the household, to all other members is applied the antitoxin.

I don't know of anything that has appealed to my attention any more strongly during the world war. I don't know of anything that has appealed to it more strongly in a medical way than the exceedingly brilliant results from the use of typhoid vaccine as a prophylactic among our boys and all the boys who had it used upon them in the great war. I feel that typhoid vaccination should be recommended to all. I gave it to my boy and I feel that all young adolescents should have it thrust upon them just as we urged upon them the smallpox vaccination.

The high caloric feeding of Dr. Hackett likewise appealed to me. Some of us old fellows remember our method of handling our cases with a few pints of milk for diet. Economically, it is an exceedingly easy method of treating our cases. Hygienically and dietetically, I don't see any advantage. It is liquid outside of the body—what could be more pernicious in a way—I do feel that milk should be used with the utmost discretion and with a full realization of the one fact I mentioned, that the liquid is a solid the moment it enters the stomach, because curdling takes place immediately and it has to be broken up immediately by the inefficient body juices.

Milk is an economic ideal food, easily obtained, so comparatively pure, but digested in these cases only with the aid of emulsions, such as a little gruel or broth or cereal or with lime water or with the addition of some water. The use of buttermilk, or various malted milk preparations are exceedingly valuable. Let a man drink one pint of milk, letting him have it for both food and drink, is to my mind unscientific in the treatment of typhoid fever. One pint of milk plus a pint of eggnog, plus some of the rich cereal soups, plus the fruit juices for the stimulating action on the secretions, plus possibly some of the other drier foods, such as bread or toast—then we have a diet exceedingly high in caloric value. We have a diet which will bring our patient up in a few weeks after he leaves the bed and will bring the patient out so that he can return to the ranks of labor a few weeks after leaving the hospital.

I would commend his method of treating the early cases, only it seems to me that would be just about ideal for the first eight or ten days. When the danger of toxemia is practically removed, then cautiously, exceedingly cautiously, adding to the diet as we found it necessary, found it indicated, adding day by day a little change in the diet. I believe we can bring out our patient into labor life much more rapidly and more efficiently than otherwise.

DR. E. W. HAASS, Detroit: There are some unusual features that are quite different from what we see in the ordinary

run of typhoid fever. The association of diarrhea, gastrointestinal disturbances, with the typhoid. It is not unusual, when you have a sporadic case of diarrhea, that five or six other members of the family had diarrhea before. You find in such epidemic cases, these epidemics were solely the result of accident, contamination due to water supply. Flushing out toilets, etc., some careless individual, allowing the water to escape into the water supply, which accounted for the epidemic Dr. Hackett had to deal with. We had a similar epidemic along the river in one of our big rubber factories, due entirely to the same cause. Outside of that, there is very little typhoid fever we have to contend with in Detroit at the present time.

The interesting things here are the association of the various infective agents with this typhoid and with these diarrheas. In a group of 26 patients, you will have 100 per cent. of diarrhea; whereas, in just as many cases of sporadic typhoid in Harper Hospital, over several years, we haven't had a single case of diarrhea. We know that there is an association of various infective agents, such as colon bacillus infection, the dysentery group, and para-typhoid and typhoid. One seems to prepare the way for the other for infection.

Dr. Hackett's blood counts were very illuminating and coincided with the statistics I gave the Michigan State Medical Society about an equal number of cases of sporadic typhoid we had in Harper Hospital. Of course, the most valuable diagnostic agent is the blood culture. It requires facilities every individual has not got. For that reason, I have laid so much stress upon the absolute relative white count. Our figures conclusively show what Dr. Hackett has shown again. If the blood count is high, it is simply because there is some complication we must discover.

The blood count low in other conditions, in influenza, our first blood counts made us think we were dealing with typhoid fever. Our blood counts were as low as 1500 and 1200 in the late epidemic.

WHEN SHOULD THE GALL BLADDER BE REMOVED?

WM. J. GILLETTE, M.D.
TOLEDO, OHIO.

Modern operations by the abdominal surgeon upon the gall bladder and its ducts are now comparatively safe, so far as life is concerned, and in most instances most satisfactory, but unfortunately a small percentage of cases are followed by so much pain and discomfort with other serious symptoms that the patient is uncomfortable in the highest degree and sometimes invalidated. The causes for and the best means to overcome such after results, reducing them yet further in number, constitutes the most important question in gall bladder surgery today. In looking over the literature of the subject which, by the way, is enormous, we find a variety of answers to it. In the opinion of most surgeons the causes for bad after results may be summarized principally as overlooked stones, failure to deal properly with adhesions, persistent infection, and malignancy. W. J. Mayo lays especial stress on the form of infection known as the "strawberry bladder" described by MacCarty.

The answer to the question how overcome best, in the most efficient manner, serious after results of gall bladder surgery observed, lies,

in the opinion of most surgeons, in either long continued drainage of the gall bladder, or cholecystectomy, or cholecystectomy with drainage of the ducts.

The idea seems to be gaining ground judging from the literature and discussions in medical societies that cholecystectomy should be performed more frequently than in the past, and John Deaver goes so far as to say it should be performed in practically all cases. (1) In addition, he advises the drainage of the ducts with a T drain.

W. J. Mayo thinks cholecystectomy should be done in 80 per cent. of cases. C. H. Mayo in a study of 242 cases of cholecystotomy in which but 53 per cent. were cured, 38 per cent. improved and 9 per cent. not improved, places against this showing a study by him of 219 cases of cholecystectomy in which the cures were given as 71 per cent. with 22 per cent. improved and 7 not improved. Graff and Weinert traced (2) 130 cholecystectomy cases and found 73.4 permanently cured. While Schulz was able to trace 145 out of 510 cases with 100 per cent. of cures. (3).

It would seem from these reports that cholecystectomy should be the operation of choice to obtain better after results. Between the 53 per cent. cured by cholecystotomy observed by C. H. Mayo and the 73.4 per cent. cured by Graff and Weinert by cholecystectomy there lies a difference of 20.4 per cent. to the credit of ectomy, and in estimating the difference in his own work between these operations, between the 53 per cent. of "otomies" and 71 per cent. of "ectomies" there lies 18 per cent. more cures to the credit of ectomy. While these results and the opinions of men of wide experience would indicate ectomy to be an operation of superior value, yet I question whether we should close the subject here and accept ectomy as practically a universal operation without a consideration of the function of the gall bladder, and whether the patient is as well off without it as with it.

The ancient sentiment, "I had rather be wrong with Galen than right with any other man," does not contain the true scientific spirit, and we should only accept teachings from others when they accord with our own daily experiences. Statistics are acknowledged as misleading and should not be accepted from any source as containing the entire truth of the matter. I am sure there are many surgeons within reach of my voice who can show hundreds of otomies

done with complete success, their patients never after experiencing either pain or discomfort from their operated gall bladders.

If, of course, it can be shown that the gall bladder has no function of consequence, then its removal when at all diseased should be a matter of course, as with the appendix. While its function at the present time "has not been definitely established," yet it most certainly does have function and possibly of more importance than is generally recognized. And I quite agree with W. H. Magie (3) when he says:

"Recognizing the fact that the gall bladder is not a vital organ and that man seems to get along well without it, it still may be true that our patient does not get along so well without it as if he had it still functioning." "The facts are that we have no means of knowing how much better off a patient might have been if the gall bladder had not been removed."

While the function of the gall bladder has not been to date entirely established, we do know something of it. That it is solely a reservoir for bile can no longer be maintained. C. H. Mayo and John Deaver think it is a tension bulb to relieve the liver from undue back pressure. The elasticity of its walls permitting this, and its contractions which occur 8 or 10 times (7) a minute constituting an important factor in regulating the flow of bile into the duodenum. According to Werelius (6) respiration assists greatly in this action. The function of the gall bladder must be one of importance or nature would not so generously provide for its absence, in the dilated ducts that so promptly appear. The hepatic and common ducts are muscle covered tubes capable of distention, and have contractile power sufficient to overcome the sphincter of Oddi, in the absence of the gall bladder, and they fortunately take on its function. In fact, some of the lower animals, as the horse, have no gall bladder and its work is carried on normally by the ducts, a fact which may argue against our belief that it is best conserved in man. I take it the regulation of the flow of bile into the duodenum will eventually be recognized as the chief function of the gall bladder, but it, no doubt, has others of value as the secretion of mucus for the protection of the pancreas and duodenum, also according to Whol (8) the mucus mixed with bile gives it valuable physiological properties.

That the gall bladder has something to do with altered stomach secretion is asserted by Ohly and other observers, who found that after its loss 70 to 80 per cent. of cases had disturbed secretion of H. C. L., and I am sure this obser-

vation of Ohly accords with my own. If now these facts are sufficient to show that the gall bladder has function of importance, then it must be conceded it should be conserved when possible, and removed only when its function is destroyed or in all probability cannot be restored. This proposition granted, it follows there must continue to be a field for cholecystotomy as well as cholecystectomy.

I think surgeons will agree that cholecystectomy should be done when there are adhesions about the gall bladder and infection is likely to persist in Luschkas' crypts, indicated by enlargement of the Lymph glands along the ducts.

In malignancy, gangrene, obstruction of cystic duct by stone or otherwise producing a cystic gall bladder. There seems to be a doubt, however, in the minds of some surgeons regarding the strawberry gall bladder and the advisability of its universal removal. Dr. Bevan says "for him it does not exist." All these conditions may be summarized by the statement that the gall bladder should be removed when the elasticity of its walls is impaired or likely to become so beyond restoration by inflammation or otherwise, and its power to regulate the flow of bile into the duodenum completely destroyed or greatly impaired, and with this impairment the destruction of its glandular secreting apparatus. It has not seemed to me that its content of black or viscid bile constitutes a sufficient cause for its removal.

That the gall bladder should be retained when possible by reason of the greater danger of ectomy rather than otomy is not with me a valid argument. That cholecystectomy carries with it a higher death rate than "otomy," I think is the general impression among surgeons, but the experience of the writer based on 211 operations of the gall bladder does not bear it out. Of the 211 cases operated there were 44 ectomies with 3 deaths and 167 otomies with 13 deaths, or a death rate for ectomies of 6 per cent. + and for otomies of 7 per cent. +. Now when it is taken into consideration that ectomy was done in the gangrenous, the perforated and many of the suppurating gall bladders, in fact, my worst cases are included in the 44, I think I am warranted in the opinion that otomy carries with it a slightly higher death rate than ectomy.

That continued drainage of, at least, 14 days, and the careful removal of all stone in the bladder and ducts are the most important factors for cure I am convinced, for of the 167

otomies there have been so far as I know but 6 reoperations, 2 for overlooked stone, one of these in the ampula of Vater, one for a gangrenous gall bladder that presented some features of interest. In this case, a year after an otomy had been performed upon a woman with an enormously pendulous abdomen with extreme ptosis of stomach and intestines. She had following an attack of influenza the severe pain of gangrene, and I reopened her abdomen, where I found the gall bladder adherent to the surrounding viscera, the liver remaining in its normal position. The abdominal ptosis had so made traction on the bladder that its blood supply had been cut off, with gangrene.

A fourth case was reoperated for cancer and the other two for persistent infection with pain. While I have found it difficult to compare with certainty the difference in the after results of my ectomies and otomies, I am quite of the opinion stomach disturbances are more frequently observed following "ectomies" than "otomies," and this paper is written and presented in a belief that the absence of function of the gall bladder has something to do with such disturbances, and should be conserved when possible, I am sure this may be done in a much larger proportion of cases than is now often recommended, if we employ better drainage and careful and complete removal of stone from both bladder and ducts. In fact sufficient reasons for its nearly universal removal are not entirely apparent. The slightly higher death rate of otomy, if it exists, I am sure, is counter balanced by the benefits of continued gall bladder function and the possibility of its subsequent employment for drainage of the pancreas, liver and ducts, and further, if after an otomy the gall bladder should not be restored to health it can easily be removed.

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DISCUSSION.

DR. A. D. McALPINE, Detroit: In my experience the majority of cases are "otomies." There is no doubt in my opinion that a cholecystectomy in the hands of the average surgeon carries with it added risk by trauma and the mortality is bound to be large. In the hands of the expert the mortality is about the same as with cholecystotomy. In the essayist's analysis of the cases of "otomy," I cannot understand how the mortality is higher. If you take the pathology of the gall-bladder into consideration, whether with a known infection or a supposed infection, all gall-bladders ought to be removed,

because we know so much about focal infection that we want to get rid of that focus of infection, but I think we fail to realize that the gall-bladder is a focus of infection. In cases of gangrene of the gall-bladder, unquestionably the gall-bladder should be removed. I have had cases with duct packed with stones, a stricture of the cystic duct and a carcinoma, where we had to do cholecystotomy. We have to take into consideration the condition of the patient in an acute infection of the gall-bladder. In the event of an acute infection, I think they should all be removed.

DR. E. S. JUDD, Rochester, Minn.: I have heard this question discussed from many angles. Some years ago I heard a paper at the Wayne County meeting—I think by Dr. Carstens—in which he said we were carrying it too far. I think that is true. I do not believe every gall-bladder should be removed. It is not our experience that every gall-bladder that is operated on should be removed in order to cure the patient. I think the difficulty is that we do not study our cases. Deaver has shown that 54 per cent. of his cases with stones had sterile bile. As Dr. Gillette says, at the time of drainage if we do not remove the gall-bladder, we can always do it later. I think Dr. McAlpine brought out a good point about the technic. The question is whether we are more apt to get in trouble doing "ectomy" than "otomy." I think, as Dr. Gillette said, that the mortality is higher in cholecystectomy than in cholecystotomy. That is true with us. There is naturally more infection.

I made quite a study of the function of gall-bladder at one time in my experimental work on dogs and we showed, as I have said before, a dilatation taking place in the duct after the gall-bladder was removed. These changes undoubtedly show that the gall-bladder had a definite function and this probably is just about as Dr. Deaver and Dr. "Charlie" have said before, that the principal function of the gall-bladder is the drainage of the liver. There is one other thing, however, regarding what happens after the gall-bladder is removed. I found in a case that over fifteen years before had had the gall-bladder taken out, practically no trouble at all. The patient was practically well, so I think a person can get along perfectly all right without a gall-bladder. I think there is a place for cholecystectomy, especially in cases where the gall-bladder is packed with stones. There is another class of cases in which this is the operation of choice, namely, in cases where the infection is very great. Cholecystotomy is a simple procedure and should be done if possible; then if necessary a cholecystectomy can be done as a secondary operation.

DR. C. D. BROOKS, Detroit: I have always occupied rather the middle ground and I am glad the paper this afternoon simply suggests a question and that there is no final dogma given as to whether a gall-bladder should or should not be removed; that the Doctor has simply stated his experiences—that some cases should be removed and others should not. I was glad to hear that cholecystectomy should only be done in selected cases, but with the experience I have had I feel that cholecystectomy should be performed more often. Of the cases I have had 80 per cent. where it was done to only 20 per cent. where it was not. I have come to that conclusion not by going to clinics, but from my own experience in cases I have operated and which have returned for re-operation to me—probably some of them have gone elsewhere—that cholecystectomy should be done. I have had a number of cases, at least twenty, during the last year and a half on which I did a secondary operation; whereas now I do an "ectomy" first and they are cured, instead of doing an "otomy," and having the patient an invalid for six months.

As to the "strawberry" gall-bladder, we have to open the gall-bladder and ascertain the condition before deciding what to do. Now instead of sending these patients to my medical friends for a while and have them send the cases back to me, I do an "ectomy" and they get well—these same "strawberry" gall-bladders. If there is any gall-bladder that should come out in my opinion it is this "strawberry" gall-bladder, where you cannot make the diagnosis before you open the gall-bladder.

Some of the reasons why cholecystectomies are harder than cholecystotomies are because the surgeons do not get a proper exposure. I think an "ectomy" is easier than "otomy."

I think, with Deaver and Mayo, that in an infected gall-bladder associated with cystic duct stones it is wise to drain the cystic duct. I would not do an "ectomy" without drainage. I would not try to do an "ectomy" with cystic duct stones without drainage. In those cases in which we cannot do a cholecystectomy because of the patient's condition, we simply open the gall-bladder and put in a tube and we get much better results. I also believe that in those cases with

high temperature we should not wait too long before doing an "ectomy." I think it is wise to do as we do in golter surgery when we ligate the poles and do an excision in thirty days, two weeks or three months. I think it is not wise in these patients with gall-bladders to wait too long before doing the secondary operation. We will get a much easier operation. Then the patient will get well and stay well instead of going on for a year or more and then having the cholecystectomy done. Technically, a secondary operation on the gall-bladder is not an easy one. It is easier to do an "ectomy" in the first place if an "ectomy" is indicated.

DIAGNOSIS OF DUODENAL ULCER.

JOSEPH A. ANDRIES, M.D., F.A.C.S.

DETROIT, MICH.

The anamnesis is the most important factor in the diagnosis of duodenal ulcer. Moynihan claims, that it is not necessary to examine the patient for duodenal ulcer, as the history alone is sufficient to make a diagnosis: The physical examination gives no evidence upon which the diagnosis can be based, it is practically nil. However, Moynihan's contention, must be taken figuratively, as he, no doubt, only wishes to emphasize the absolute necessity of a careful history by this drastic statement. A physical examination should be made in every case, as a means of detecting complications.

The symptomatology, as gained from the history of patients afflicted with duodenal ulcer, is very characteristic. Nevertheless, it must be correctly interpreted, and if all other complications are not carefully taken into consideration, a mal-diagnosis will be the result. The most prominent symptom is pain, burning in character, which does not bring on discomfort until 2 to 4 hours after the ingestion of food. It is localized in the epigastrium and can be relieved by pressure in this region. An increase in pain comes on when the patient is hungry (hunger-pain) and a diminution of pain is experienced when food is taken. The hunger pain comes on in periodical attacks; this symptom alone is not sufficient to make a diagnosis. The patient suffers with pain for a length of time and then a period of freedom from pain occurs, having no relation to medication. After stomach lavage the pain usually becomes worse. It disappears upon going to bed (prone position) and upon dieting; but these two latter facts are suggestive of ulcer of the stomach, as well as of the duodenum. The so-called "season pain" is characteristic of duodenal ulcer, and spring and fall exacerbations are distinctly accentuated, which may probably be the result of infections that

*Chairman's Address, Surgical Section, Michigan State Medical Society, May, 1919.

take place in spring and fall. The nocturnal pain, which occurs at about 2:00 a. m., is an important part of the history. Pain awakens the patient at this hour and is quieted by taking food; for this reason these patients often put some food at their bedside upon retiring. The attacks of pain are frequently the consequence of colds, wet feet, hasty eating, excitement, over-exertion, and come on particularly during the cold season.

Pain in the epigastrium is usually more indicative of gastric ulcer; in duodenal ulcer it is usually more to the right. This is not constant, however.

The typical symptoms of duodenal ulcer are preceded by signs of distress and bloating, which usually appear about 2 hours after eating, accompanied with pyrosis. The accumulation of gas, which is associated with constipation frequently can be relieved by catharsis and enemata.

Gas and belching are common to all abdominal diseases associated with hyperacidity; such as, gastric or duodenal ulcer, biliary tract infections, adhesions, gastropostosis or appendicitis.

It induces the patient to believe there is gas in the stomach; the sensation is caused by irritation of excessive acid. He makes endeavors to belch and finally swallows enough air to belch some.

Fluoroscopic examination with barium and buttermilk shows only a small bubble in the fundus of the stomach. (Magenblase).

Nausea and vomiting, especially the vomiting of blood, are a very rare occurrence. Over-exertion may bring on hemorrhage with collapse of the patient and without causing any pain. Palpitation of the heart may occur through the loss of blood. The passing of blood will give the stool the characteristic black color.

Vomiting does not occur in the ulcer of the duodenum, unless there are complications.

Regurgitation is indicative of ulcer of the stomach.

A periduodenitis, an attempt at perforation, an inflammation of the peritoneum, or an infected gall-bladder are usually responsible for regurgitation, nausea, or vomiting.

Vomiting of food contents alone is usually found in gastric ulcer or where gastric ulcer is a complicating factor.

Vomiting of bile may usually be attributed to disease of the biliary tract or some inflammation of the peritoneum.

It has been observed that patients with duodenal ulcer will have a chill lasting from 10 to

20 minutes with a rise of temperature, which may come on at uniform intervals and may last an indefinite time. This incidence may be misleading and result in confounding the ulcer with tuberculosis of the bowel. Different causes for chills have been suggested; principally, the extension of the infection through the common duct, which could take place without causing jaundice. Another cause may be the infection through the lymphatics from the duodenum to the transverse fissure of the liver, into which the lymphatics pass. In this way infection of the blood stream may cause chills. An infection extending into the transverse fissure of the liver may then present a radiation of the pain toward the thorax, shoulder blade or neck, similar to the radiation of pain in cholecystitis.

Infection of the common duct and the gall bladder are frequent in duodenal ulcer. After the infection subsides a periduodenitis or a pericholecystitis may remain with no history of gall bladder disease. In periduodenitis and pericholecystitis tenderness is not as marked as in gall bladder disease, but they usually leave adhesions.

It may be well to call attention to the differentiation of tenderness and pain in duodenal ulcer, as well as peptic ulcer and cholecystitis. As long as the inflammation is confined to the mucosa and muscularis, there is no tenderness. The pain is colicky and wave-like in character, relieved by pressure and brought on by muscular contraction through an irritation of the sympathetic nerve. Whenever the inflammation attacks the serosa, causing a circumscribed peritonitis, tenderness is elicited, rendering palpation and pressure painful.

According to Moynihan the objective symptoms may be wanting and still the diagnosis can be made with certainty from the anamnesis.

In several cases we found the symptoms so typical, that the diagnosis for duodenal ulcer was evident, and still a negative finding at the time of operation had to be recorded; and in one instance a duodenal ulcer was found, where there were no indicative symptoms. It must be admitted that two cases operated upon, where no ulcer of the duodenum was found, did not have all the characteristic symptoms as defined by Moynihan; the pain 2-4 hours eating was present, but the chronicity, the attacks of pain at night and the periodical return of pain was wanting.

Much stress has been laid upon the rigidity of the right rectus muscle to the right from its

median line, which in our experience is very indefinite. Palpation is also of less importance and value for the diagnosis.

The percussion of the region of the stomach with short, sharp taps of the hammer, as described by Mendel, was sensitive only when there is an ulcer of the stomach or duodenum; in other diseases this mode of percussion does not cause pain.

In differentiating doubtful diseases of the stomach the X-ray is by far the most reliable aid at our disposal. Bier considers it of the greatest value in cases of hour-glass stomach and cancer of the stomach, especially, when there is a beginning stenosis of the pylorus; but in cases of duodenal ulcer the X-ray does not offer the same advantage for diagnosis. Many shadows in the X-ray plate have been designated and found to be duodenal ulcer; nevertheless, it has not yet been shown that they are really characteristic for this disease. In the opinion of Barcley an ulcer of the duodenum excites more frequent and stronger peristalsis of the stomach with a correspondingly more frequent opening of the pylorus and a consequent quicker propulsion of the stomach contents into the bowel. The tonus of the stomach is mostly increased.

Kreuzfuchs claims, that the emptying of the stomach is only increased during the first period after taking a meal. This increased and more frequent peristalsis of the stomach is a constant finding in duodenal ulcer, but loses its importance as a characteristic symptom, because it is also found in achylia, icterus caterhalis, pancreatic tumors, etc.

The bismuth spot remaining in the duodenum is a true sign of ulcer according to Moynihan and Barcley, when it can be demonstrated after the stomach contents have been discharged and that it is located in the most proximal part of the duodenum. The sacculation of the scar of the ulcer is claimed to be the cause of the bismuth shadow. In one of our cases this bismuth shadow was clearly shown in the X-ray picture, but upon opening the abdomen no ulcer of the duodenum could be demonstrated.

Theoretically it seems probable that the duodenal ulcer, having formed a scar stenosis, should be demonstrated by the X-ray as a consequent dilatation of the stomach or of the bulbus duodeni; but, as is generally admitted, even in a deep seated and small lumen stenosis, there frequently is no dilatation of the duodenum present. Bier, who takes issue with Moynihan, relative to making a diagnosis from the

anamnesis, advises the most careful study of stenosis in the X-ray picture, as they are very deceiving.

Aside from the history, blood in the vomitus and stool and occult blood is a most important diagnostic sign. Occult blood in the stool together with Moynihan's anamnesis, makes the diagnosis positive. In doubtful cases repeated and careful examinations for occult blood should be made, with the exclusion of blood from food and bleeding from mechanical irritation of other parts.

Most surgeons agree that the chemical analysis of the stomach secretions is of little diagnostic value.

Several errors in the differential diagnosis between ulcer of the stomach and duodenal ulcer had to be recorded, because we accepted the history as sufficient and the differentiation simple. The anamnesis alone may be easily misleading. The indication for operation in most cases is of greater importance than the differential diagnosis, and consequently, if a mistake is made in locating the ulcer in the organs, the same can be rectified at the time of the operation without any detriment to the patient. The operation is indicated in either case.

The differentiation between cholithiasis and ulcer of the duodenum may at times be difficult, but a carefully taken history will clear up the doubt. Care must be taken that a possible gall-stone shadow in the X-ray picture is not mistaken for a bismuth spot on the ulcer.

Constipation is usually found associated with gastric and duodenal ulcer. In infections of the biliary tract and gall-stones there is usually no constipation.

Infections of the biliary tract are a center for the distribution of infection; such patients usually give a history to that effect. Ulcer of the duodenum and stomach are the end results of infection and the patient gives no history of infection. Ulcer of the stomach and duodenum is therefore not accompanied by headache, rise of temperature, infections of the joints, coated tongue, or any signs of sepsis, unless complications have occurred.

Icterus being absent may be differential. Many diseases of the biliary tract do not entail icterus, but its absence together with the other symptoms may be an aid in diagnosis.

Loss of weight in gastric and duodenal ulcer is due to starvation, either voluntary or forced, or by lack of assimilation.

In disease of the biliary tract it is usually due to infection.

Duodenal ulcer symptoms are "clearcut."

Pain to the right of epigastrium.

Pain comes on one or two hours after meals and is relieved by taking food.

Gastric ulcer developing when a duodenal ulcer is present disguises the symptoms of duodenal ulcer.

Pain comes on immediately after eating and merges with the pain of duodenal ulcer that comes on one or two hours later. Prolonged pain may therefore be suggestive of the presence of duodenal and gastric ulcer at the same time. Vomiting or regurgitation may then disguise the duodenal ulcer. Constipation is prominent in both diseases.

Relief upon taking food in duodenal ulcer does not take place, if a gastric ulcer is present. The symptomatology of gastric ulcer covers the symptomatology of duodenal ulcer.

If a clear history of duodenal ulcer is given, that later gives place to symptoms of gastric ulcer, a diagnosis of both conditions can be made.

But if a gastric ulcer develops first and is followed by duodenal ulcer it is impossible to make a double diagnosis. The only possibility of discovering the presence of a duodenal ulcer would be an examination of the duodenal cap by X-ray.

The presence of a gastric and a duodenal ulcer in the same patient is common.

The differentiation between appendicitis and duodenal ulcer does not present any special difficulties.

A gastro-enterostomy should not be performed, when there is no ulcer of the duodenum.

Stretching the duodenum gives an anemic white spot near the pylorus, as described by the Mayos, which must not be confounded with ulcer. In doubtful cases an incision transversely into the bowel or stomach may be warranted and an exploration made from the inside with the finger, if necessary inspected with the eye.

The author has come to the conclusion, that the diagnosis of duodenal ulcer sometimes presents many difficulties, and that a diagnostic fallacy may easily be the outcome, if all the aids of diagnosis are not employed to reinforce the diagnostic structure. Acute appendicitis usually is not a diagnostic engima. Nevertheless, this very simplicity has often been the scapegoat of error, because it gives the surgeon an unwarranted sense of positive assurance. Com-

plications are liable to arise in any disease; but, complicity and simplicity are not synonymous. On the surface all may seem serene and simple; where the eye and hand do not penetrate, conditions may be very complex. A rapid conclusion, based solely upon the history of the patient may easily cause the chagrined surgeon to blush with diagnostic embarrassment. The diagnosis of duodenal ulcer requires time and study.

WHEN IS STERILIZATION OF WOMEN JUSTIFIABLE?

REUBEN PETERSON, M.D.

ANN ARBOR, MICH.

It has long been an accepted rule of obstetrics that pregnancy may not be interrupted except on the ground that such interruption be necessary to save or prolong the life of the mother or to preserve the life of the fetus. Another rule is that pregnancy shall not be interrupted on the judgment of one physician alone, but, except where circumstances render this impossible, only after deliberate consultation with one or more physicians of recognized standing. Moreover, from the physician's standpoint there is no debatable time during pregnancy when these rules do not apply. Scientifically and practically the rights of the fetus are the same from the moment of conception to the hour when natural labor begins. A physician has no more right to empty the uterus after the skipping of one menstrual period than he has to interrupt pregnancy at a later date, the only difference being that his opinion as to when pregnancy shall be interrupted in the event of the mother's life being endangered may be influenced by the effect of such interruption upon the chances of the fetus for extrauterine existence. For instance, in a case of a woman with cardiac decompensation with small chances of the pregnancy continuing up to the point when the child would be viable, it would obviously be the part of wisdom immediately to empty the uterus in the interests of the mother whose life is endangered. On the other hand, if in a case of marked cardiac decompensation pregnancy has advanced to the sixth month, the physician naturally in the interests of the fetus soon to reach the age of viability will not be in favor of the immediate interruption of pregnancy if the mother's chances are not markedly diminished by such delay.

I trust I may be pardoned for setting forth these rather trite and generally accepted obstetric rules of procedure, but it seemed a necessary preliminary to the consideration of the question of the sterilization of women. Although there exists quite a literature on artificial sterilization, it must be acknowledged that the profession is not nearly as conversant with the rules governing this procedure as is the case with the artificial interruption of pregnancy. This is explainable on the ground that the interruption of pregnancy being a safer procedure has been performed since the beginning of obstetrics while artificial sterilization has only been safe and practicable since the advent of antiseptic and aseptic surgery.

Only those having to do with large public and private clinics have any realization of the number of women which for one reason or the other has been rendered incapable of reproduction. Much of this work has been performed for disease and is justifiable in that it restores the woman to health. It must be confessed, however, that in many cases the woman was sterilized through inexcusable errors of diagnosis and upon insufficient pathological grounds. It is not the purpose of this paper to deal with the class of cases where sterilization resulted from the removal of the diseased female organs of generation but to confine it to the indications for the artificial sterilization of women, either with or without a coincident operation, when the purpose of the procedure is to prevent future conception.

It will be at once apparent why the question of interruption of pregnancy is exceedingly valuable to a consideration of the indications for the artificial sterilization of women, for both have grounds in common although they differ in other respects. Stated generally, bearing in mind the interests of the State, fetal life should not be destroyed or conception prevented except on the ground that the mother's life be endangered by the continuance of the pregnancy or by the advent of future conception. In other words, the same rules ought to govern both procedures with this difference; in pregnancy at all stages there is another life to be considered, such life to be sacrificed only to preserve the mother's, while in the other class of cases, sterilization is performed entirely in the interests of the woman, for only a possible future life need be considered.

The physician will be spared much if he agrees to the above statements and acts upon

these rules of procedure. The physician who is not firm in his refusal to interrupt pregnancy except to save or prolong the life of the mother, if he is even willing to discuss the justifiability of interruption in a given case on other grounds, is in a very disagreeable position to say the least. So many apparently good social and economic reasons why particular pregnancies should be ended can be advanced that the minute he makes this debatable ground, his troubles begin. In artificial sterilization this is even more true. The woman dreads to have a child or go through the ordeal of another pregnancy and labor; she has enough children and for social and economic reasons does not desire more; these and many other reasons are advanced and would be given far more frequently than is the case except for one thing. The laity are not as yet so well educated regarding artificial sterilization of women as they are along other physiologic and operative lines. Sterilization of women carries with it in the public mind the loss of the ovaries from which women shrink, since it means diminished or gradual loss of sexual desire. That this is true is demonstrated by the comparatively large number of cases where women refuse certain types of operations necessitating sterilization until they can be assured that their ovaries will not be removed and that tubal sterilization will not interfere with sexual desire or marital relations.

It will be necessary in any consideration of the indications for artificial sterilization to keep in mind two kinds of sterilization, which in lieu of better definitions may be spoken of as, 1. Primary Artificial Sterilization, 2. Incidental Artificial Sterilization.

1. Primary Artificial Sterilization. Under this classification would come all cases where artificial sterilization is the primary end in view, the patient not being pregnant at the time, and the operation performed solely to prevent future conception.

2. Incidental Artificial Sterilization may be defined as sterilization performed during the course of another operation in the belief that the patient's life or well being would be seriously impaired by future pregnancies.

Obviously, if artificial sterilization can only be performed on pathological grounds, for serious organic changes in the maternal organism, or because the past history of the individual has shown that pregnancy will bring about changes which will seriously threaten her life, primary sterilization will not often be performed. The

surgeon will hesitate to advise sterilization in the presence of organic disease which renders any kind of operation hazardous, for he will reason correctly that he is not justified in exposing his patient to certain risks in order to safeguard her against a possible additional danger by which she never will be menaced in case she does not become pregnant. For example, a woman with diabetes of a certain grade can never be subjected to operation without considerable risk. Artificial sterilization of such a woman would be subjecting her to certain risks. If the operation be not performed and pregnancy does occur, the latter can be interrupted with minimum risk to the patient. The same line of reasoning will apply to other organic diseases, the indications for primary sterilization depending upon the extent of the disease and the dangers of the operation in each individual case. However, it may be stated in a general way that this careful weighing of the indications and contraindications for primary sterilization is bound to narrow the field of this operative procedure. If the condition of the woman is such that pregnancy would be a serious additional menace to life, her condition would be such as not to warrant the performance of an operation to prevent something which may never occur.

In the second class of cases, incidental artificial sterilization, the situation is entirely different. Another operation must be performed for the safety or comfort of the patient. The puerperal history of the patient may show that her life would be seriously menaced or made so miserable as to be unendurable by another pregnancy. In such a case, since the additional operative risk of coincident tubal sterilization is practically nil and need not be considered, it is not only justifiable but it is the duty of the physician to consider the advisability of sterilization. For example, a woman with chronic nephritis in the child bearing period who must be operated upon for the removal of a pelvic or abdominal tumor should be sterilized as a part of the operative procedure if pregnancy would seriously jeopardize her life and if without sterilization her puerperal history is such as to warrant the assumption that she will become pregnant.

It is important to study each case carefully in order to decide wisely whether or not to sterilize, and the careful study of the patient's puerperal history is absolutely essential in this connection. While incidental sterilization may

be indicated in a young woman who has had frequent pregnancies during her married life it may perhaps be decided unnecessary in an older woman who has been sterile the entire period of, or a greater part of her married life.

If artificial sterilization can be performed upon pathologic grounds alone, only those cases can be judged suitable for the procedure where the organs or organism of the woman is so impaired as to render future pregnancies extremely dangerous, or parts of the birth canal may be in such condition as to make it necessary to provide against future conception. In any case there should be definite reasons for sterilization which time can not change except to make them more urgent. If this be true, there is no place for temporary artificial sterilization and all operations with this end in view are based upon false premises and need not be considered.

A woman never should be sterilized without the knowledge and approval of the patient herself, that of her husband and the family or another physician. This applies not only to the removal of diseased tubes or ovaries or both but to artificial sterilization as well. It is the custom in the University Clinic for the husband or the woman herself if she be of age, unmarried, widow or divorced to sign a paper before operation authorizing the surgeon to perform such operation as he may deem necessary. It would seem advisable to be even more explicit when artificial sterilization is contemplated, for it is an extremely serious thing to deprive a woman of her capacity for reproduction. That is why, personally, I am not enthusiastic over primary sterilization of the insane, or those who are defective mentally, since they are incapable of giving assent to the operation. I would not refuse to perform incidental artificial sterilization on people of this class when the operation is advised by an alienist of high standing but I certainly would hesitate under the existing laws of the State to perform the primary operation. Most of the sterilization laws passed by many states have been declared unconstitutional, showing that it is a debatable question and that one should not lightly perform such operations upon this class of people.

Conditions where sterilization may be considered:

1. Pulmonary tuberculosis.

Primary sterilization will rarely be indicated in pulmonary tuberculosis. Great advances have been made in the treatment of this form of tuberculosis, so that it would never be justifiable

to sterilize for the incipient or moderately developed case. In advanced cases, primary sterilization will seldom be employed on account of the danger of any operative procedure under these conditions.

Incidental sterilization should be considered where the woman with advanced tuberculosis must have a laparotomy for other imperative conditions. In case the woman has children and desires future sterility on the ground that pregnancy will augment her disease, the operation would be justifiable and therefore indicated.

2. Other forms of tuberculosis.

Each case must be judged on its merits but generally speaking sterilization will rarely be indicated except in tuberculosis of the abdominal and pelvic organs. In tuberculous peritonitis in the female the genital organs are usually primarily or secondarily involved and when affected will be removed.

3. Disease of the kidneys.

Both primary and incidental sterilization may be indicated in chronic disease of the kidneys. Experience has shown that a woman with chronic nephritis should not marry since the patient's condition is bound to be made worse by pregnancy. Not only is this true but the chances of the pregnancy going to term and a healthy child being delivered are greatly reduced by the presence of the disease.

Each case should be carefully studied as to the type of severity of the kidney lesion. If a woman marries against advice she should not be subjected to the dangers of sterilization for fear of pregnancy since this condition may not supervene. If she become pregnant and either aborts spontaneously or the pregnancy is interrupted to save her life, it is well to consider the advisability of primary sterilization and to perform the operation if the kidney lesion so warrants, with the idea that future pregnancy is probable and that in that event her life will be endangered. Moreover, under these conditions her chances of going to term and giving birth to a healthy child are very poor.

Under the heading of disease of the kidneys should be included those numerous cases where the woman has threatened or actual eclampsia with each pregnancy although she is in quite normal condition with no or very slight urinary findings when not pregnant. In my experience such women have had scarlet fever or some other contagious or infectious disease when young which has left its mark on the kidneys, the lesions being increased to the danger point

by the advent of pregnancy. This class of cases is very well illustrated by the following:

Case I. No. 1516, age 40, married, American, housewife. Had scarlet fever at age of ten. Nephritic symptoms developed at age of 30. Has two living children, 13 and 10 years old. Miscarried during second pregnancy at second month due to typhoid fever. Had eclampsia with third pregnancy at eighth month, in convulsions for several hours, child removed manually and saved. About a year later aborted at fourth month on account of nephritis. Three years later a vaginal Cesarean section was performed for nephritic condition at the seventh month and child died. Had influenza and active nephritis in October, 1918, and has had a great deal of headache and backache since.

Pelvic examination showed an enlarged, retroflexed uterus, a badly lacerated cervix and a second degree tear of the perineum. The urine was quite normal showing neither albumen nor casts.

The patient was operated upon January 11, 1919, the series of operation consisting of dilatation and curettage, bilateral trachelorrhaphy, perineorrhaphy and shortening of the round ligaments. In addition the patient was sterilized by removal of wedge shaped pieces from each uterine cornua and burying the distal ends of the tubes between layers of the broad ligaments. Convalescence was normal.

4. Diseases of the heart.

My own experience has shown that women with organic lesions of the heart where the compensation is even fairly good do remarkably well during pregnancy. Where compensation has about reached its limit or where there is persistent decompensation with its attendant symptoms, edema, ascites and congestion in various parts of the body, due to a dilated and overloaded right sided heart, and experience has shown that the woman will probably become pregnant if not rendered sterile, primary artificial tubal sterilization is indicated.

Incidental sterilization in this class of cases should not be performed upon insufficient grounds but only after careful study of the patient's past history in reference to pregnancies and labors and after careful estimation of the present and future severity of the heart lesion.

The following is illustrative:

Case II. No. 1614, age 19. First para. Has severe mitral and aortic lesions with a greatly hypertrophied heart which is on the border line of decompensation. Her condition was such that it was thought inadvisable for her to undergo the strain of labor in a first pregnancy, although as far as could be judged the pelvic measurements were normal. Abdominal Cesarean section was performed August 28, 1917 and a healthy female child weighing six and one-half pounds delivered. It was deemed advisable to sterilize the patient at the time of the operation which was done by

cornual resection. Mother and child made good recoveries.

5. Mental diseases.

Primary sterilization for these conditions has already been considered and the conclusion arrived at is that the operation cannot be often performed on account of the uncertainty of existing laws. This is not absolute and under certain conditions I would not refuse to do primary sterilization, but I would want to be certain that the facts in the case warranted the operation beyond any shadow of a doubt. My reasons for this hesitancy are based upon the changing opinions of the alienists themselves regarding the prognosis of many of the mental diseases. The worse or hopeless cases are carefully guarded in places where pregnancy is not apt to occur. Recovery may take place in the other class of cases and the surgeon confronted under these circumstances by a woman justly indignant at being deprived of the possibilities of becoming a mother, absolutely without her consent.

I would look upon the question a little differently in mentally deranged women who had to be operated upon for some other condition, although even here the surgeon must be doubly careful since he is dealing with a patient whose competency to consent to the operation may always be questioned.

Some of the patients have been subjected to incidental sterilization in the clinic but only upon the advice of alienists and those most concerned with the patient. The following is an illustrative case:

Case III, No. 10,120, age 34, married, two children 5 and 1 year old. Has suffered from a mild form of manic depressive insanity since birth of last child. Family surroundings very bad. On February 15, 1919, the uterus was dilated and curetted and an extensive colporrhaphy for rectocele performed. The abdomen was then opened and a diseased appendix removed which was followed by a shortening of the round ligaments for marked retrodisplacement. Cornual resection of the tubes was performed upon the advice of Dr. Barrett who had given a careful consideration to all aspects of the case. Patient made an uninterrupted convalescence and has improved greatly mentally and physically.

6. Pelvic contraction.

At the present time an otherwise healthy woman with obvious pelvic contraction has no right to demand primary sterilization to prevent pregnancy, if she has never borne a child. Presumably she knew her condition and assumed the risks when she married. Furthermore, the risks of elective Cesarean section at term are not

much more than primary sterilization. Theoretically in this class of cases sterilization incidental to the Cesarean section is not warranted, no matter how many sections may be performed. Practically, however, common sense leads us to accede to the wishes of the patient and her husband if she has risked her life twice and does not care to assume the risk again. The following is an illustrative case:

Case IV, No. 1373, age 20, married, slightly, generally contracted pelvis, large child. Test of labor, no progress after 24 hours of labor. Delivered of male child weighing 10 pounds and 7 ounces, May 16, 1916. Mother and child made excellent recoveries. The second pregnancy differed from the first in that the patient suffered a great deal from nausea and vomiting and edema of the feet and ankles. Female child weighing 6½ pounds was delivered by abdominal Cesarean section May 6, 1918. At the request of the patient who claimed that she did not want to take the chances of a third pregnancy and operation and with the consent of the husband, sterilization was brought about by cornual resection. Mother and child made good recoveries.

7. Defects in the reproductive organs due to previous labors or operations.

There may exist certain defects in the uterus or its appendages or in the birth canal which render delivery by the natural passages extremely hazardous and undesirable. Time does not permit of the consideration of all the possibilities along this line. I will merely illustrate by the following cases:

Case V, No. 1518, age 37, married, housewife. Personal history negative, married and has three children aged, 8, 11 and 14; labors normal. For the past two years has known she had a fibroid tumor. Examination showed a large uterus with a fibroid nodule the size of a lemon on the anterior surface of the uterus and slightly to the left of the median line. As the patient had lost considerable weight and strength from excessive flowing, an operation was decided upon. April 21, 1919, the abdomen was opened and a club shaped adherent appendix removed after the fibroid nodule had been enucleated. The nodule occupied the entire anterior uterine wall and the uterine mucosa was exposed after the enucleation. The cavity was filled in by interrupted cat-gut sutures and the peritoneal edges brought together.

The case had been discussed prior to the operation with the physician in charge, with the patient and with the husband, and it had been agreed that it was inadvisable to take any chances in case of a myomectomy of a rupture of the uterus at a subsequent labor. Hence, it was deemed best at the operation to sterilize the patient by cornual resection which was done. Patient made a good recovery.

Case VI, No. 858, age 27, married, was operated upon for a complete tear of the perineum resulting from a protracted labor in a funnel pel-

vis and a large child. Examination showed the soft parts terribly lacerated and the vagina so contracted that the cervix could not be located. There was a complete tear of the perineum, the lower part of the rectovaginal septum being torn upward one inch.

October 2, 1912, the complete tear of the perineum was successfully repaired so that control of the feces and gas resulted. However, there was so much scar tissue in the vagina that the patient was advised in case of another pregnancy to be delivered by Cesarean section. On July 4, 1916, she was delivered by abdominal Cesarean section of a male infant weighing 7 pounds and 10 ounces. Both mother and child made good recoveries.

This patient was again delivered by abdominal Cesarean section November 29, 1918, of a female infant weighing 7 pounds and 12 ounces. Both she and her husband requested that she be sterilized at the second operation as they did not desire to take any further chances. The request seemed reasonable under the circumstances and tubal sterilization was performed by wedge-shaped cornual incisions. Both mother and child made good recoveries.

Incidental sterilization it seems to me was decidedly indicated in Case V. Here was a woman with an impaired and weakened uterus due to the removal of a large fibroid nodule. The resulting cicatrix was bound to be less firm than that resulting from a clean cut and properly sutured incised uterine wall. It did not seem right, considering the number of her children and their need of her, to let her be subjected to another labor with a uterus which, to say the least, would be handicapped.

In Case VI where there was a contracted outlet and a vagina almost obliterated by scar tissue, another delivery except by Cesarean section would have been not only dangerous but probably impossible. Here abdominal Cesarean section was clearly indicated, as was sterilization at the second section.

8. Operation of such a nature that subsequent pregnancy and labor are rendered dangerous.

Without attempting to enumerate all such operations, suffice it to say, that all abdominal or vaginal uterine fixation operations are contraindicated during the child bearing age unless accompanied by tubal sterilization. The truth of this statement has been borne out by the reports of dystocia and fatalities resulting from a neglect to sterilize, or the employment of the wrong technic with resulting pregnancy. The following is an illustrative case of incidental sterilization for operations of this type:

Case VII, No. 10,080, age 45, married, 2 children 21 and 23 years of age, was operated upon

for uterine prolapse February 1, 1919. The inter-position operation was performed which consists in separating the anterior vaginal wall from the bladder and pushing the latter upward separating it from the uterus. The fundus is delivered through the anterior culdesac and tubal sterilization performed by cornual resection. The fundus is stitched to the resected vaginal walls thus holding the bladder upward supported on the posterior uterine surface. The operation is completed by an extensive flap splitting perineorrhaphy by which the levator ani muscles are brought together in the median line.

The patient returned home with her prolapse cured and in no danger of becoming pregnant.

In the large majority of these marked cases of prolapse, the women are beyond the menopause. Where they are not and desire more children another type of operation must be utilized.

SUMMARY.

1. Fetal life should not be destroyed or conception prevented except on the grounds that the mother's life is endangered by the continuance of the pregnancy or by the advent of future pregnancy.
2. There are two kinds of artificial sterilization of women: 1. Primary artificial sterilization. 2. Incidental artificial sterilization.
3. In primary artificial sterilization, the end in view is solely to prevent future conception.
4. Incidental artificial sterilization means the sterilization of the woman during the course of another operation in the belief that the patient's life or well being would be seriously impaired by future pregnancies.
5. Primary artificial sterilization will be comparatively infrequent, since the organic disease which calls for the operation at the same time renders it hazardous.
6. In the uncertainty of the woman with organic disease requiring sterilization, the physician will hesitate to advise this procedure when the uterus can be emptied with less danger in case pregnancy supervenes.
7. In incidental sterilization, the woman can be rendered sterile by a simple additional operative technic the dangers of which are practically nil.
8. All operations devised for temporary artificial sterilization are based upon wrong premises, since the indications calling for sterilization are bound to grow worse, never better.
9. As a rule a woman should never be sterilized without her consent and that of her husband, and of her family or other physician.
10. Careful study of the history of the patient, especially her puerperal history, her past

and present condition, will enable the physician to decide for or against primary and incidental artificial sterilization in:

1. Pulmonary tuberculosis.
2. Other forms of tuberculosis.
3. Disease of the kidneys.
4. Diseases of the heart.
5. Mental diseases.
6. Pelvic contraction.
7. Defects in the reproductive organs due to previous labors or operations.
8. Operations of such nature that subsequent pregnancy and labor are rendered dangerous.

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DISCUSSION.

DR. J. H. CARSTENS, Detroit: It seems to me there is nothing to discuss. The paper so thoroughly covers the ground in every direction that I cannot find anything really to discuss. Some of the little details we may have different views on, but the one general principle laid down is the most valuable of all, and that is, that each case must be considered individually. They are all different, and you cannot lay down any absolute rule. If we start with that, we will probably all agree.

In pulmonary tuberculosis I think it is a good rule that women should be sterilized. In cardiac trouble I do not think it is needed. Those women have children and get along fine. In kidney trouble I think it is more serious again.

As to the woman's consent, the woman's opinion is not a great thing. I do not care much what a woman tells me about what she wants or what she does not want. I know what is good and I'm the best judge of that job. Perhaps a woman comes to me and says, "I want to be sterilized, will you do this operation and make me sterile?" That woman does not know what I know. I can see into the future. She may have two children, but I have seen those children die and she would give anything in the world to have another child. Or I have seen this woman's husband die and she would marry again, or would be in a position to marry again if it were not for the fact that she was sterile. I have seen many of these cases. In the woman who has three or five or six children and is about the age where she will cease to have children, I think you are more justified in sterilizing that woman.

In the cases of insanity the Doctor talked of, I believe I am a little inclined the other way. I believe in eugenics and I think where anybody with those defects, where the tendency

is toward insanity, and where the woman has had trouble with the first child or the second child, it would be a good idea for that kind of people not to survive. I think we have enough of them to take care of. To support them is the "white man's burden," and I think we are better off without them.

In tuberculous peritonitis I object to removing the womb, the tubes and ovaries. Why? Because they are always young women and you sterilize them and ruin them for their lives. You operate for tubercular peritonitis and you cure them, and those women can be married and have children and have no future trouble. To remove the tubes and sterilize those women because there are a few tubercles on the tubes, I think is bad practice. Because there are thousands and thousands of tubercles around on the peritoneum everywhere you can put your finger, but those tubercles are going to be absorbed and disappear, and those on the tubes will disappear too. There is no doubt at all. We think the tubercles can come up through the uterus and infect the tubes, but they do not come up in that way at all. They come through the lymph channels. Nobody here has ever seen such a case. I have seen only one and I have probably seen more cases than any of the rest of you. I saw one case where there was a tubercle in the uterus, but they have no bearing at all as a rule. If the tube is destroyed, you have to remove the tube just as if she had no tubercular peritonitis, but there is no use to remove the tube because there are tubercles around on the tube the same as on the peritoneum otherwise.

The point about bringing on a premature labor in these cases I think is perfectly right in certain cases, but still I am the last one who does it. I do not like to interrupt pregnancy, but once in a while I have to do it to save a woman's life. Here comes the question of Caesarean section. A way back when we made abdominal section and it was a dangerous operation, cases away back in the days when no single case recovered, when for a hundred years in Vienna they did the Caesarean section and never a case recovered, an Italian said to take out the whole uterus and thus avoid infection. So we did the Porro operation and I did some of those. One case was a young woman and the child afterward died, and for years afterward that woman cried every time she met me and said, "Oh! If only you had not removed my womb, I could have another child," and that was a lesson to me and never after that did I do such an operation unless some other complication made it absolutely necessary. One patient I operated on four or five times by Caesarean section and after the third I suggested that she ought to be sterilized, but she was a good Catholic and wanted to keep on having children by Caesarean section.

So far as the consent of the woman's husband and family is concerned, that is a matter of fact. We must have a thorough understanding and they must understand the case. I think we ought to try and prevent pregnancy in those cases. The great thing is we talk a lot about pregnancy, but we do not know absolutely how to prevent it. There are all kinds of means employed and they are all more or less successful, and in those cases of the women who ought not to have children we ought to find a means to prevent pregnancy and then if they do become pregnant, we can interrupt the pregnancy and thus avoid the dire consequences of the continuation of the pregnancy.

DR. JOSEPH E. KING, Detroit: I would like to know what the opinion would be about the use of radium to effect sterilization in those individuals who are afflicted with nephritis, or for the purpose of producing temporary sterilization in the cases of women who may recover and eventually have children.

DR. JOHN N. BELL, Detroit: Mr. Chairman: I recall a case seen several years ago, a good Catholic woman with four or five children, and she and her husband requested sterilization. The operation was done and she afterwards was, I presume, chastised by the priest for having this done, and she became temporarily unbalanced from worry over the sin she had committed. However, later on she was restored to a normal condition by forgiveness and assurance that she had been forgiven for the act. It was a well-defined mental condition due entirely, I believe, to worry because of having the sterilization done. I think we ought to be very careful about sterilizing a woman without good reason.

DR. C. E. BOYS, Kalamazoo: Mr. Chairman: I endorse very heartily the points made by the essayist this morning, but I have a little stronger conviction about tuberculosis than Dr. Peterson suggested. I am intimately associated with Dr. Shepard of our city and he sees a great many of these cases. One woman became pregnant and it took three and a half years for her to be restored to her usual health. She became pregnant again and that time it took two years for her to be

restored on account of the tuberculosis, and because of the third pregnancy she is now down and out. I am of the opinion that that woman should have been sterilized after the first pregnancy. I have a nightmare about tuberculosis, I just abhor it and it always seems to me that whenever anybody has tuberculosis, even in an incipient form, they have just as big a load as they can carry without adding pregnancy to it, and even though we know that they may get through the pregnancy all right, then comes the real strain, the labor, the loss of blood, the exhaustion incident to the labor and pain, and then added to that, if she tries to nurse her baby, that is the straw that breaks the load and she goes down, often to stay. I believe where there is a definite tuberculosis, we have a really definite indication for sterilization. Of course, she should understand the situation, I agree with Dr. Peterson about that, but I do feel that if it were my own wife and she had tuberculosis in any form, I should certainly consider it an unwarranted calamity for a pregnancy to ensue.

DR. MARY WILLIAMS, Bay City: Mr. Chairman: I have a case of a woman who has two children and she has had, I think, about four or five miscarriages. Two or three have been in the early months. The two last times she has gone seven months and she came in the other day and said she had been advised to have her uterus removed. She had a badly lacerated cervix and I advised her to have that repaired and see if she could not go through a pregnancy. She wants children, has tried in every way to have them. The last miscarriage was in April when she had the Flu, but she has done this every time. She says she simply has some feeling in her side as if something slipped down and then she is in labor. I advised her to have some operation on the cervix and see if that would not remedy the condition.

DR. REUBEN PETERSON, Ann Arbor, (closing): Mr. Chairman: In regard to Dr. Carstens' discussion, it seems to me that you cannot help bearing particularly upon the pathological grounds for sterilization. We have to continually keep these in mind. As I said in the paper, the minute that we begin to discuss these things with the patient we are lost, because there will be many social and economic reasons why it seems advisable for that woman to have any more children, or to have any child. If we attack it on the strictly pathological grounds, that pregnancy will endanger this woman's life, then the question of whether she should or should not be sterilized will be discussed. If, on the other hand, there is no pathological ground for her sterilization, we are just as much prohibited from discussing future conception in that woman as we are with the woman who comes to us and says, "Doctor, I am three months' pregnant and I am going to give a series of parties and this pregnancy is going to interfere with those parties," or, "My husband is only getting thirty dollars a month and I cannot afford to have a child," or any of the grounds on which they come to us. We have no right to discuss an interruption of the pregnancy on those grounds. Only when the woman's life is in danger are we justified in discussing the question.

Secondly, Dr. Carstens is right when says he pays no attention at all to the request of the woman, but we can go further and say if there are no pathological grounds. If there are pathological grounds, the woman should be informed of the danger. She has the right to risk her life if she wants to. If the woman says, "That may be true, but I want to have a child and I will not be sterilized" she has that right. That is why I am so opposed to the sterilization of the mentally defective. I do not agree with Dr. Carstens when he says he thinks we have enough of these people and we had better prevent descendants of these people as much as possible. The best alienists have said that only about 8 per cent. of insane women have descendants that are insane, where it can be proved that those descendants are insane. Consequently, we must deal with this question very carefully. It does not necessarily follow that where a woman is insane, she will have an insane child or that the child will become insane. For instance, look at the way we are importuned about epilepsy. Not a year goes by that I do not have women brought to me to have their ovaries removed because of convulsions occurring during the menstrual period. I have gone through that experience and have seen the convulsions occur just the same after the ovaries are removed. I would not sterilize a woman who had epilepsy, because it is by no means proved that a woman with epilepsy will have an epileptic child.

My experience is entirely different from Dr. Carstens in regard to tuberculosis of the uterus. In many cases we have established the diagnosis of tuberculosis of the pelvis and peritoneum from examination of the curetted material. In other cases where we have opened the pelvis without curetting

and found tuberculosis, the curetting of the uterus has shown tuberculosis present. In my experience many cases come from below upwards and infect the tubes. His statement that the tubercles are scattered around on the tubes and are of no particular significance is perfectly true, but in my opinion, the tubercles do come from below upward and infect the tubes.

In regard to Dr. King's inquiry, the paper was simply one on indications for sterilization and I did not take up the operative part of the question. The use of the X-ray and radium may be considered an operative means for the prevention of pregnancy. In my review of the literature I found that both X-rays and radium would produce temporary sterilization and permanent sterilization was not at all conclusive from the use of both these agents. Consequently, I would consider the use of these two agents as not at all proved as regards permanent sterilization. The literature is very unsatisfactory in that it shows all kinds of operations for sterilization and all of them have failed, even the resection of the cornua of the uterus and the burying under the peritoneum of a wedge-shaped piece from the uterus has failed. The tying off of the tubes and the resection of the tubes is a failure. Some men have devised means of shutting off and confining the tubes anterior to the uterus, but that also has been proved a failure. Some men have gone so far as to take the tubes and put them up in the inguinal canal and that has failed. All kinds of technic for sterilization has failed, but the cornual of the tubes has proved most successful.

As regards Dr. Boys' part of the discussion, here again I would fall back on my opinion that sterilization must be determined upon pathological grounds only. I contend that incipient tuberculosis and moderately advanced tuberculosis have no part in sterilization. If it proves necessary, the uterus can be emptied at any time. Where a woman has such advanced tuberculosis that her life would be seriously endangered by pregnancy, the mere operative procedure of sterilization would be dangerous.

In regard to the question of Dr. Williams, I should want to know definitely about the cause of the repeated abortions. Is it syphilis, is it the cervix, or what are the causes? Is her life seriously menaced by future pregnancies? According to her testimony I should say it was not seriously menaced and that the woman could not justifiably be sterilized. If her abdomen was opened and it was decided or proved that her life would be saved by cornual resection, I think the question should be considered.

SEROLOGIC EXAMINATIONS IN EYE AND EAR CASES.*

DON. M. CAMPBELL, M.D., L.R.C.S. (Edin.)

DETROIT, MICH.

The importance, far-reaching influence and significance of information supplied by laboratory diagnosis will be admitted to every one whose experience is at all extensive in the diagnosis and treatment of diseases of the eye and ear. The bacteriology of many diseases of these organs makes of itself an important chapter, but can only be referred to here in passing, fascinating as its study would be.

The phases of the subject to which attention is here directed are: 1. The Wassermann and allied reactions. 2. The tuberculin tests. 3. The complement fixations for various infections other than syphilis and tuberculosis. 4. The blood picture including total and differential blood counts for the white cells; the red count and the condition of the red cells—haemoglobin estimation and the presence of other cells of a

*Read before the Detroit Ophthalmic and Otologic Club.

transitional or adventitious type. 5. Urinary analysis, including other things than the presence or absence of albumen or sugar.

The latter, of course, is not a serologic test, but must be here considered in order to complete the diagnostic picture.

The Wassermann and allied reactions for lues is of so common occurrence and of such evident utility that not much need be said of its great value from a diagnostic, prognostic and therapeutic viewpoint. The blood Wassermann when negative, should be repeated after provocative doses of potassium iodide or very small doses of neo-salvarsan, to get accurate data.

It would seem advisable, however, to refer to the value of the Wassermann reaction in connection with a condition in the eye with which it is not perhaps so often associated. I refer to traumatism, in which the constitutional condition revealed by a positive Wassermann reaction not infrequently gives a new viewpoint on the prognosis and therapeutic management of the case.

A mental review of the disastrous traumas of the pre-Wassermann period as contrasted with equally severely injured eyes in which a positive Wassermann pointed the way to a more successful therapy is quite striking in some cases. The following brief history illustrates this point:

M. L., age 36, male, metal worker, received a severe contused wound of the cornea of the right eye, the missile being a large piece of metal hurled with great force from a machine.

The vision was reduced to good perception of light and good projection. The cornea was found bruised and the epithelial layers desquamated over the central area. X-ray examination negative. Tension normal. A good prognosis seemed justified provided a choroidal rupture through the macula had not occurred.

For five days after the injured eye progress was very satisfactory. The blood in the anterior chamber cleared so the pupil became visible. The lens was not dislocated.

The eye then became very painful. Irido-cyclitis supervened and after a few days the tension rose to 60 mgm. mercury as shown by the Shiotz tonometer. The vision, which heretofore had been rapidly improving, quickly deteriorated, the cornea became hazy, the iris discolored and the ciliary region tender when palpated. A small nodule of a yellowish-gray color began to form in the iris.

The secondary glaucoma was the most disconcerting element. Was it due to a dislocated lens? Or was it due to plastic irido-cyclitis, and what was the cause of the latter? Should we trephine? Or do an iridectomy?

The nodule in the iris suggested lues or tuberculosis. A Wassermann was done and showed a ++++ positive reaction. The case was per-

fectly cleared up by bringing the man to the point of salvation by intensive mercurial inunctions.

In the matter of interstitial keratitis the Wassermann reaction has reduced lues as an aetiological factor to well below 50 per cent. In Moorfields, when I was a student there in 1886-87, Nerthship placed syphilis well up in the 90 per cent. class as a cause of interstitial keratitis.

The same may be said of choroiditis or in fact of uveitis.

There have been several cases of delayed healing of the wounds after enucleation of the tear sac and after mastoid operations which have shown positive Wassermann reactions and thus given information which led to a constitutional therapy, which soon brought about a favorable termination.

THE TUBERCULIN TEST.

Local—(1) Calmette; (2) Constitutional as exemplified by temperature variations and the skin reaction of von Prieret have all played a most important role in properly classifying the aetiology of various eye affections. Where syphilis has lost in popularity as a causative factor, tuberculosis has gained, thus many more cases of interstitial keratitis are now recognized as tuberculous in character than was formerly thought possible.

So, too, in the choroidal affections many are now known to be tubercular where formerly they were looked upon as all of luetic origin.

The calmette test is unsuitable and dangerous for use in eyes which are the seat of tuberculous lesions. There is also a danger in such cases of a diagnostic dose producing an undesirable focal reaction in such an eye.

The tuberculin test, which is most reliable as of true diagnostic value, is that by diagnostic doses of tuberculin and observing the reactions produce local, focal and most important of all, constitutional as exemplified by variations in temperature, a record of which must be kept for several days preceding the giving of the diagnostic dose.

The tuberculin test, which is of least inconvenience to the patient and freest from danger to the eye affected with a tuberculous deposit, is the skin test of von Prieret. While it is generally recognized as of but little value as a reliable test for active tuberculosis because a very high percentage of adults will show a positive reaction, nevertheless the test has an extremely important role to play as an indicator

of the probable most successful plan of treatment to be employed in a given case.

Here is a personal observation which is given you out of a very large experience in a wide range of ocular affections, including episcleritis, scleritis (superficial and deep) scleritizing keratitis, deep punctate keratitis, interstitial keratitis, irido-cyclitis, choroiditis with vitreous opacities, chronic and relapsing irido-eyelitis. When an individual carrying any of the above group of ocular affections shows a positive von Priquet reaction his eye affection will yield to gradually increasing doses of tuberculin given at five day intervals.

In the rather rare combination of a positive Wassermann and a positive von Priquet, salvarsan, mercury and tuberculin will all need to be employed to bring about a cure. But it will surely need the tuberculin if the von Priquet be positive.

The following is a striking example of the value of this test:

CASE II.

An example case of an old lesion in the choroid being improved with tuberculin therapy.

A girl 23 years old, who had failing vision for several years and repeated examinations and intense luetic therapy, with no results. The Wassermann in this case was negative, and the von Priquet was positive as done in our office. She was put on the tuberculin treatment as outlined for adults, and after three months' treatment the vision in the right eye had improved from 6/30 to 6/12, and the left eye from 6/60 to 6/20. The case was continued under treatment and when examined three months later the improvement in the right eye had been maintained and the left eye improved to 6/15.

A search had been made in this case for focal infection and her tonsils had been removed by enucleation. This operation was followed by some improvement which however had ceased to progress when the tuberculin treatment was instituted.

Example of a long-standing keratitis, a boy 20 years old, seen May, 1918, with a history that one month previously the left eye suddenly became inflamed and painful to light. There was a history of similar trouble at a previous time. He had been under treatment by a physician receiving luetic therapy. The eye had gradually gotten worse, when I saw him the vision was reduced to counting of fingers at three feet, the pain was reduced. Extensive pannus and ulceration. He had been advised by his doctor to have the eye removed. He had von Priquet and Wassermann examinations made, the Wassermann being negative and the von Priquet

strongly positive. The boy promptly improved and in July had a vision of 6/60, which could be improved with a glass to 6/15. The boy has been seen at intervals and the eye has remained perfectly quiet and the scar is gradually diminishing. This is a case where failure to have proper serological tests had led to prescribing an inefficient therapy.

The preparation used in treating tubercular cases in the office has been an aqueous solution of old tuberculin as prepared by Parke, Davis & Co., of which 1 c. c. represents 1/100,000 mm. of the old tuberculin. The dose given hypodermically gradually increased at weekly intervals, the initial injection being 2/10 cc. in children, and 3/10 cc. in the adult case. This was increased in the case of the children by 2/10 cc. dose weekly until the maximum dose of 1 cc. was reached, while in adults it is increased 3/10 cc. until the maximum dose is given of 1 cc. As a rule it has been possible to increase the dose each week by 2/10 cc. or 3/10 cc. In cases where severe reaction followed the last dose, the strength dose, at the previous injection was repeated but not increased. In general the therapeutic results accomplished followed very promptly, even as early as with the second injection, children having responded more readily than adults.

As an example of a remarkable result in a child, a boy 4 years old, whose father died of tuberculosis two years previously, came to the office in August, 1918, for phlyctenular keratitis. This cleared up with local treatment and tonic. Child had a recurrence in November accompanied with a very severe conjunctivitis and a purulent discharge and the cornea became quite cloudy. The local treatment and tonic was repeated but the case progressively got worse. A von Priquet was done. The von Priquet was positive and the Wassermann negative. The mother was strongly opposed to the hypodermic therapy, but after considerable persuasion was induced to give this boy the treatment. The results were immediate. Following the first injection the discharge was greatly reduced, the swelling of the lids began to subside, the photophobia and lacrimation was absent and the cornea began to clear. The treatment was carried on as outlined in general for children and after three injections the child was apparently recovered, the lid surfaces being smooth, shiny and the cornea clear.

As an example of another acute case of a child—a colored girl, age 12, came in the office

in January, 1918, with a history of the eyes being inflamed and red for one week, lids sticking in the morning, and the eyes very sensitive to light with a great deal of tears.

Examination showed a purulent conjunctivitis, the cornea spotted with infiltrations and quite hazy. The Wassermann was negative and the von Priquet strongly positive.

She was immediately put on the tubercular treatment as outlined for children, and after taking two injections there was a very marked improvement in all symptoms. The girl dropped out for three weeks and when she returned to the office was in a very bad condition, after three more injections the girl's condition completely cleared up.

This is a case where without a serological report we would have been very likely to describe the etiology as being luetic.

The possible influence of tuberculosis as a cause of ptychenulear keratitis is one which has received much attention and many comments both favorable and unfavorable. There seems no doubt now that tuberculosis must be included as at least one of the principal causes of this disease. In this as in all other clinical manifestations under consideration one must admit that it is probably only *one* of the causes, and its proper place given in the list of aetiological factors and a due amount of consideration given tuberculin in laying out a line of treatment.

The advent of tuberculosis as a cause of episcleritis, superficial and deep scleritis and scleritizing keratitis, and the employment of a tuberculin therapy in such cases has added much to our ability to successfully cope with these very stubborn ocular lesions.

THE COMPLIMENT FIXATIONS.

Of the study of this phase of the serologic diagnosis in eye diseases a preliminary report only can be made.

This much can, however, be stated, that with a positive fixation for the gonococcus much can be done by the use of an antigenococcus serum for the cure of stubborn and recurring attacks of irido-cyclitis, which must be looked upon as an ocular manifestation of so-called gonorrhreal rheumatism.

The following is the complement fixation tests in nine cases of recurring irido-cyclitis which showed a negative Wassermann and a negative von Priquet:

1. Sept. 25, 1917. Friedlander—Strongly
E. N. Pseudo-Diphtheria—Weakly

2. Sept. 25, 1917. Colon—Strongly
G. A. Pneumo—Weakly
3. Oct. 3, 1917. Friedlander—Strongly
B. K. Staphylococcus—Strongly
4. Oct. 5, 1917. Friedlander
S. F. Pseudo-Diphtheria.
5. Oct. 9, 1917. Streptococcus
R. W. Colon
Staphylococcus
6. Nov. 7, 1917. Streptococcus
G. A. B. Pneumococcus
7. Nov. 18, 1917. Streptococcus—Strongly
H. G. C. Influenza—Strongly
8. Nov. 20, 1917. Streptococcus—Moderately
J. B. S. Pseudo-Diphtheria—Weakly
Pneumo—Moderately
9. Sept. 29, 1917. Staphylococcus—Weakly
Friedlander—Strongly

It would seem not unlikely that all these nine cases of recurring irido-cyclitis showing a negative Wassermann and negative von Priquet reaction had their aetiological factors in focal infections such as the teeth, tonsils, adenoids, accessory nasal sinus, appendix, gall-bladder or prostate gland. A very important field of investigation would be this: When a focal infection is found, to make a bacteriologic study of the germ life at that focus and see if it could be co-related with the complement fixations.

In two or three cases this has been done where the focus was found to be an apical tooth abscess.

However, not enough material is yet at hand to make a worth-while report, but it can be said that as far as it has gone the results are at least encouraging for a basis of a clearer aetiological diagnosis in these cases.

THE BLOOD PICTURE.

But little need be said about the importance of this phase of the subject. There are, however, two observations which should be presented to you and two cases to be referred to in this connection.

In the blood studies of quite a large number of cases of irido-cyclitis of the acute type it was found that many showed a low white count, showing a reduced resistance. Many of those cases were placed upon large doses of sodium salicylate and recounts made of the blood during the progress of these cases, and this common thing was observed:

In those cases showing an improvement in the eye conditions there was always an improvement in the white cell count, and when the irido-cyclitis reached a stage of complete cure the white cell count was above normal.

In other words, a medicinal leucocytosis has been induced.

Did it raise the resistance, and thus materially help in controlling the infection?

Again, many cases of retinal hemorrhage, especially those past middle life, will show in the blood picture a polycythaemia rubra. The exhibition of pot. iodide when followed by absorption of the retinal hemorrhage is also accompanied by a return of the red count to normal.

CASE III.

Baby S., age three years. A case of tympanic infection with mastoid tenderness which had existed for three weeks when brought under observation. The child was extremely pale and of a grayish color. Temperature 99 to 100, pulse 110 to 120. Extirpated cervical glands.

This child's appearance was so far from satisfactory that a complete blood count was made which showed, in addition to a marked leucocytosis, a clear picture of lymphatic leukemia. Death took place without the help of surgery within forty-eight hours.

CASE IV.

G. J. Severe injury of right eye through the ciliary region seven weeks before coming under observation. When first seen, a full blown case of sympathetic inflammation was found, the sympathizing eye showing plastic irido-cyclitis-synechia ciliary tenderness. Here is his blood picture:

You will observe that the large mononuclear cells are not increased. He showed a negative Wassermann and a negative von Pirquet. Perhaps this case is the exception which proves the rule, or is the mononuclear increase present only in the period preceding the onset of the sympathetic ophthalmia? I do not know.

THE URINARY ANALYSIS.

This phase of the examination is interjected at this point for two reasons: First, because itself it gives very valuable information in many ocular affections; and second, because the gastro-intestinal tract can undoubtedly be the origin of an infection or a toxemia which has in its clinical course a local manifestation in the eye, and furthermore this departure from health in the gastro-intestinal tract will frequently be manifest by the presence in the urine of such products as indican, acetone or diacetic acid.

Of late, also, some very valuable work has been done by the examination of the feces in ocular manifestations having their origin in the gastro-intestinal tract.

The work of Bouchard some twenty years ago on auto intoxication still has a value for the ophthalmologist, and the more recent work of Dr. Meyer of the absence of the colon bacillus in cases of recurring eye infections are interesting and important.

The routine serological examination in eye infection of various types involving the eyeball itself should include:

1. A Wassermann blood or spinal or allied tests.
2. A von Pirquet skin reaction for tuberculosis.
3. Complete blood picture.
4. The various complement fixation tests.
5. Complete urinary analysis.
6. Examination of the feces.

DISCUSSION.

DR. ALBERT E. BERNSTEIN, Detroit: The idea that tuberculous infection is the cause of so many eye troubles is not at all new, but it is a good thing to bring out. I think a great number of us when we see a case of keratitis, almost immediately think of syphilis. I remember some twenty years ago seeing Michel of Berlin and some of his work in tuberculous eye infections. He was laughed at on every hand, but he had one hundred twenty cases that were proven to be tuberculous.

In regard to children and the incidence of tuberculosis as a causative factor, one always has to bear in mind that tuberculosis is not at all uncommon in children. In fact, I believe it is pretty well admitted by pediatricians that nearly 85 per cent. of children go through a tuberculous phase before they are fifteen, and undoubtedly in that period the von Pirquet would be positive. I do not mean to say that nullifies the work of Dr. Campbell, but it must be considered.

I remember two patients I had, two brothers, one thirty-two and one thirty-four, who had repeated attacks of iritis, and the iris was found down approximately in the anterior capsule. Before each attack—this man had had a half dozen—he had a discharge from the urethra. I tried to get him to go to a G-U man, and I do not know whether he did or not. Both he and his brother had had these attacks, always preceded by this discharge.

DR. WILFRID HAUGHEY, Battle Creek: Dr. Campbell brought up the necessity of the complement fixation test in the presence of focal infections. It strikes me if you do a complement fixation test you will get positive results for the germs that are present at the site of this infection rather than for the germs that are causing the lesions in the eye. One would naturally expect that the flora of the serous infection, whether it is tonsils or sinuses or what, would show the same germs that would be developed by the complement fixation test.

DR. DON M. CAMPBELL: To me the most interesting part of the subject is the focal infections and their influence, and the possibility of future study along that line. How are we going to establish the connection between a focal infection at the apex of a tooth and an inflamed iris? It is very well to say that a patient has an abscess of the second molar and an iritis, but it is very interesting to know how it happens and the germ through which the infection is conveyed. It seems to me a study of the connection between focal infection and the result of focal infection in the eye and other parts of the body would be of very great interest and might be of practical importance as well.

MULTIPLE FISTULA (OF ANO-RECTAL
ORIGIN) WITH SPECIAL REFER-
ENCE TO THE USE OF DAKIN'S
SOLUTION AND THE PLAS-
TIC SKIN-FLAP.*

E. G. MARTIN, M.D.

Associate Proctologist, Harper Hospital.

DETROIT, MICH.

A fistula is a covered tract resulting from an imperfectly drained abscess, and complicated by chronic suppuration.

The earliest records disclose evidence that fistula often existed, and pictures are reported showing surgical treatment.

It is not the purpose of this essay to exhaust the subject, but to portray as clearly as possible the cause of fistula, its principal varieties—the diagnosis, surgical treatment, and after care; referring especially to the use of the Carrel-Dakin Solution, and the application of a plastic skin-flap operation, as suggested by the "skin sliding operation" of Beck, which has been so successfully used in chronic empyema.

The inciting factor will be considered first, so that the principal varieties subsequently named may be more clearly visualized. If you will picture mentally, an ano-rectal infection with its resulting abscess: The patient's attention is first attracted by distress—possibly a fullness and dull ache upon defecation—often by sharp lightning like pains, gradually increasing to a persistent throbbing ache; there may be a chill, and marked rise of temperature; the more deeply seated the abscess, the more generalized the symptoms. Such an abscess may develop slowly or rapidly; if slowly, its activity may subside for a few days or a few weeks, or may occasionally recover. If development is more rapid and persistent, it may open on the perineum or into the anal canal: such drainage affords temporary relief of tension, and the opening or outlet may plug or heal temporarily; subsequent development often finds it opening at another location, either inside or outside, followed again by a so-called "cure;" this process continues for weeks and years, increasing in extent as the earlier tracts cicatrize their walls, and new fields are invaded. The ano-rectal region affords every opportunity, anatomically, for the pus to burrow, on account of its loosely constructed tissue, with the fascia walls as a guide. Thus is explained the tracts leading to

the kidney, the diaphragm, scrotum, labia, and various parts of the body, where lakes of pus are often developed, making successful treatment at times almost hopeless.

Further contributing factors are incubation of the abscess by poultice, "allowing nature to take its course," and the timid incision for drainage.

The openings of fistulae determine the classification, though the specific anatomical location may be used in their nomenclature. We have simple complete, (with opening inside and outside of the anal canal); in-complete which includes Blind internal (opening inside), and Blind external, (opening outside). Muco-cutaneous and sub-mucous are self-explanatory, being named from their anatomical involvement, or location.

Multiple fistulae need not necessarily open inside the anus, though they usually do, but are named from their numerous openings and tracts, no matter when they are located and where they lead to. It is unusual for fistulae to have more than one internal opening, though occasionally they are seen with many, both outside and inside.

As to bacteriology, it is sufficient to say that the colon bacillus usually predominates in the abscess, subsequently allying itself with the various bacteria found in mixed infection. The tubercle bacillus is a factor in a comparatively small percentage of cases, and it seems reasonable to suggest that in most of those cases lowered resistance in the individual is more responsible for the fistula than a primary tubercular infection. Syphilis is a factor to be dealt with in treatment, but is not a cause of fistula.

The diagnosis is established by the personal history, careful external inspection, digital examination, anoscopic inspection, followed by the determination of the extent and location of the fistulous tracts; this determination is more easily made now, with our improved technic than formerly. Text books, and much of our current literature advise the opening and removal of the tracts, but fail to make clear how to successfully find them.

The writer, among others, uses a mixture of some white powder—preferably bismuth—mixed with vasoline, which is injected, while warm, into one of the sinuses; as it appears at other openings, they are covered by a finger, thus forcing the mixture throughout the fistulous system; using an anoscope or an anal retractor, the posterior anal wall is first observed, and will

*Read before a General Meeting of the Wayne County Medical Society, Detroit, April 21, 1919.

most frequently display a "show" of bismuth paste during the injection, which should locate the only internal opening in the majority of cases. Further investigation is always advisable. When injecting for stereoscopic X-ray pictures this procedure is continued slightly, with a finger covering the internal opening, hoping thus to further and more certainly fill the abscess cavities, and any unfilled tortuous tracts. The parts are cooled with cold applications for two minutes, still retaining the bismuth with the fingers; at this time, if any excess bismuth is in the rectum, gently mop it out with a wet sponge, and clean any bismuth paste from the outside skin before making the exposure. Many unsatisfactory pictures are due either to poor technic or to extreme sensitiveness and nervousness on the part of the patient. Satisfactory injection requires practice, and in selected cases an anesthetic is necessary.

The writer wishes to advise against the use of probes, as being painful and inaccurate in any but the simple straight tracts; the right kind properly used is very useful during operation. Methylin-blue and peroxid mixtures, are useful and more cleanly where location of an internal opening and simple office investigation is desired; for accuracy, stereoscopic pictures are absolutely necessary.

Tubercularly infected fistulae are recognized by the pink flabby granulations around the openings—the silky anal hair—and by the presence of the bacillus tuberculosis. Metastasis from fistula is frequent, dangerous, and often fatal; cases of brain abscess and spinal abscess of pure colon bacillus infection, being within the writer's recent knowledge.

The prophylactic treatment consists of early radical incision of the abscess, with free drainage. The vaccine treatment, both as a prophylactic and a curative measure, is a failure.

Medical or palliative treatment is useful only in preparation for operation; we are excepting only those who refuse surgical methods, and some few where operation is inadvisable.

It is wished to acknowledge the results obtained by Emil G. Beck of Chicago, in the non-surgical use of bismuth paste, and the remarkable results obtained in the many inoperable fistulae, which he has demonstrated to us. Such treatment in operable fistulae is impracticable, owing to the length of time required, the lack of skill and equipment by the average physician who would use it, and the almost universal failure to secure recoveries. Such fail-

ures are not only disheartening to the patient, but owing to the lost time and resistance, a definite damage has been wrought; such disheartened patients are poor advertisements for the medical profession as a whole, and are very apt to discredit the more approved and successful methods.

The operative or surgical treatment is preceded by an early cleansing of the intestinal tract with free catharsis and enemata; the fistulous system is thoroughly irrigated with a 25 per cent. solution of peroxide and boric acid, if possible and feasible; fluid diet only is allowed following the cathartic. After administering a general anesthetic, the perineal exposure or lithotomy position is obtained, the rectum thoroughly cleansed with a creosol solution, and the field of operation sterilized after necessary shaving. The technic of bismuth injection is again carried out, and with soft silver wire probes about six inches long, the main tracts are located, if possible; this procedure often requires some patience, but one is rewarded, if successful, by a simplified and more rapid technic. When the main or accessible tracts, one or more, are located by passing a probe clear through, they are opened with a knife or scissors, entirely freeing the probe; it is often possible and desirable to dissect out the tract with the probe *insitu*. When more than one opening into the anal canal is found, the second tract is opened only as far as the sphincter muscle, through which is threaded a piece of heavy silk, looped and tied to be used later as a guide in completing the incision; this further procedure is not attempted until the other muscle incision is well granulated, or as is quite possible when using Dakin's solution, reunited by secondary suture. No apprehension need be felt over lost sphincter control, since the muscle is severed in but one place at a time—as one would cut through the hub of a wheel by following any one of the spokes. When the operator is unable to insert the probe by gentle patient effort, the tracts are opened, using the bismuth paste therein as a guide; open all that can be easily found and sponge away the paste, then by gentle manipulation and probing, small off-shoots and side tracts may be discovered as evidenced by a "show" of bismuth paste; often these tracts lead to cavities of considerable size, which would mean failure and recurrence if undiscovered. The epithelial and cicatricial lining of the tracts and any areas suspected of small, even hair like tracts, must be excised; the areas laid

open are often extensive and formidable; no chance whatever should be taken. If the surgeon is not most thorough, radical and painstaking, the operation might better not have been done, since recurrence is almost inevitable.

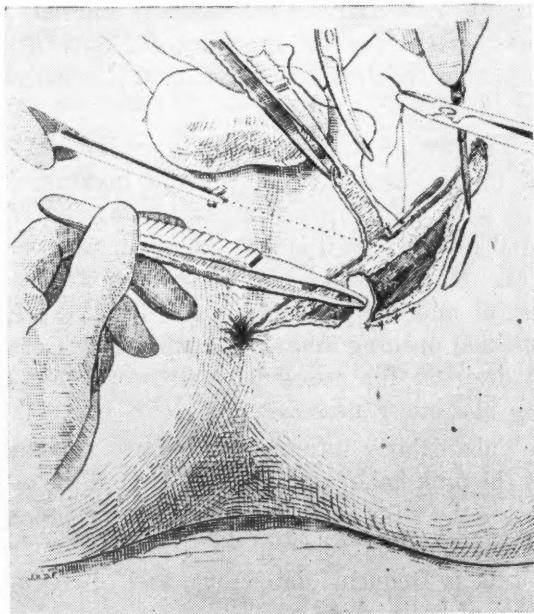
With this technic, multiple fistulae can be successfully operated, though the results of the operation are often spoiled by inexpert and careless after-treatment. Bridging over of the tracts during granulation is a great source of danger; the smallest healed-in pocket means recurrence. Examine the cases during the course of healing frequently, to avoid bridging.

The simpler varieties such as the muco-cutaneous, sub-mucous, simple complete, the blind external and blind internal are amenable to successful treatment in one's office, using a local anesthetic.

In operating on blind internal fistula, in which the indurated abscess cavity is easily palpated outside, and with internal opening in the anal canal, it has been found by the writer desirable to first cut into the abscess cavity from without, thus making a simple complete fistula to deal with; when the abscess cavity is more palpable inside the rectum, the free incision should be made at the site of the internal opening, laying the cavity fully open, and thus avoiding a complete fistula.

At the close of operation, tags, and free ends of skin are cut away, and the open surfaces and cavities packed with gauze moistened in Dakin's solution; packed to control hemorrhage, which at times is annoying, but which has never been found alarming. A perineal binder is tightly applied, and the patient sent to his bed; the attending nurse inspects, and if necessary, changes the outer dressings every hour for three or four hours. The patient is then allowed to thoroughly react, and at the end of twenty-four hours, all gauze packing is removed; a hot sitz bath given and the parts irrigated with Dakin's solution, every three hours—day and night. It is permissible to adhere to the strict Carroll-Dakin technic if it can be applied. A hot sitz bath precedes a change of dressings night and morning. The bowels are moved by castor oil or other suitable cathartics on the fourth or fifth day, and kept open by a daily enema given before the morning bath.

In six or seven days, infection will have become so inactive, that in the deep extensive wounds and broad uncovered areas it has been found desirable to place flaps of skin into the depths of the wounds where they become adherent within thirty-six to forty-eight hours. The application of this method partially covers the area with skin, thus greatly hastening recovery, since in the older technic the deep parts must fill by granulation first, necessitating a much longer time to heal. The technic of this operation is simple, and by its use it is possible to shorten convalescence following extensive fistulae often by several weeks.



The application and technique of the "Plastic Skin Flap" in extensive fistula.

PLASTIC SKIN FLAP OPERATION.

(See illustration.)

Along the edge of a wound to be treated, a strip of skin is marked off by two parallel incisions made with a keen-edged knife; the proximal incision is extended—the width of the proposed flap—longer, at the end which is to remain permanently attached; a narrow margin of skin is left between the proposed flap or strip of skin and this wound; the width and length of the flap is determined by the shape and size of the raw surface on which it is to be used; the flap is undercut as near the true skin, and as free of fat as possible; its attachment at one end is severed as illustrated and the two edges of the now uncovered raw

surface, beneath the flap, are brought together and sutured with cat-gut, starting suture at the angle of the attached end; we have now a pointed strip of skin attached at one end and turned down into and partly across the open fistulous tract; this necessarily crosses a section of the narrow margin of skin mentioned, this section is cut out, thus allowing the plastic flap to contact with uncovered tissue in its entirety; this plastic flap can usually be kept in place by a careful pressure-dressing for forty-eight hours, which is sufficient for attachment, though a stay suture is permissible. Bismuth paste is applied at this time with the pressure-dressing.

This plastic operation may be carried as far around a wound as seems desirable by repeating the procedure, described. It must be understood that the intention is not to cover the entire area at once, but furnish large healthy flaps of skin to follow the contour of the area at intervals for subsequent joining by skin proliferation.

It is very desirable at this secondary operation after the use of Dakin's solution, to close the distal (from the anus) ends of these open tracts by suture, thus, is combined secondary suture with the plastic skin-flap operation.

The daily baths and earlier treatment with Dakin's solution are resumed after the forty-eight hours have elapsed, as a prophylactic and cleanly measure.

The writer wishes it understood that in this essay he has simply tried to point out the application of some rather recent and proven methods in a new field, and his experience with the plastic skin-flap in a comparatively small series, should be considered more in the nature of a preliminary report at this time.

REPORT OF CASE HISTORIES.

A resume of twenty-six consecutive case histories of fistulae from among the writer's personal cases in Harper Hospital prior to January 1, 1919, and covering a period of about twelve months, are here recorded.

The average number of days spent in the hospital before discharge is thirteen days; the least number of hospital days was two, and the greatest number was forty-two. The average duration of the fistulae prior to operation was fifty-

seven and one-half weeks, as near as it was possible to ascertain from the histories; the least number of weeks duration was two, the greatest number two hundred and sixty. From the twenty-six cases, there were five which gave a positive Wassermann reaction, and there were five positive tubercular findings. The results show twenty-three to have recovered, two to have shown marked improvement, and one to have died after six months from pulmonary tuberculosis. There were three recurrences requiring a second operation, all of which are now recovered. The two cases recorded as "improved" were tubercular cases.

About 40 per cent. of the cases have been treated with Dakin solution, and 25 per cent. with the plastic skin flap. The period of convalescence following operation has seemed to have been much shortened by this method. One case of five years standing with positive tubercular findings, and the most extensive case in the writer's series, had been previously operated upon; she remained in the hospital forty-two days, with a recovery complete in eight weeks. In this case the plastic skin-flap was used twice following the original operation.

Eighteen less severe cases, and not included in this series were operated by the writer in his office under local anesthesia with but one recurrence. Approximately twenty cases have been operated in the Out-Patient Department under local anesthesia, with no recurrence as far as can be ascertained.

Percentage of recoveries in the series of hospital cases is 88.4 per cent. Percentage of those showing tuberculosis is 19.2 per cent. The percentage giving a positive Wassermann is 19.2 per cent. Percentage of recurrences in major cases is 11.5 per cent. and in the whole group of sixty-four—the percentage is 6.5 per cent. Eleven and five-tenths per cent. recurrence, or three out of twenty-six major cases may seem too many, but when it is considered that we are dealing with infected multiple tracts, many of which are very minute and in an area very subject to contamination, an occasional recurrence is to be, at least tolerated.

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December.

Editorials

GREETINGS.

The season of the year is once more here when the decrees of custom call for the extending of Holiday Greetings. In the past in each December issue we have proffered to all our members, advertisers and readers the *Journal's* good wishes for a Merry Christmas and a Happy Prosperous New Year. In doing so we endeavored to cause that greeting to include more than a perfunctory expression—we were sincere in our intent that each one reading our editorial greeting would perceive it to be a personal message and not an observance of a custom that was being complied with.

And so again, this season, we extend to all our members, advertisers and readers, the personal greetings of *The Journal* for a Merry Christmas and a Happy Prosperous New Year. Merry in the sense that the holiday season will be filled with cheer that rejuvenates and begets contentment. Happy and Prosperous in their fullest meaning for each who enters upon 1920, a year that is fraught with so much that is for good and evil.

We sincerely hope that to each there will accrue that measure of prosperity that will enable

us all, individually and collectively, to reap a full measure of friendship from all with whom we come in contact in addition to financial gain.

THE VENEREAL DISEASE LAW.

Last month we published the text of the Venereal Disease law that was enacted by our last State Legislature. Since then we have heard of some discussion on the part of the profession, some criticism, some threats of rebellion and in certain instances open declaration of intention of not complying with the provision of this act.

We cannot quite conceive how or why any of the profession should attempt, at this late date, to refute the purposes of this law or assume antagonistic and belligerent attitude. The law is a distinct step in advance and commendable asset in the fight to eradicate the "black plague." It is conceded that the reporting of tuberculosis, and thus gaining information as to the extent of the disease, enabled our tuberculosis organizations to combat that disease in the successful manner in which it has been done. The same object will be attained in regard to venereal disease.

The day is past when we are to look upon the venereal disease problem as a social or moral problem. It's a problem of fact that must be combated by facts and infected carriers restrained by quarantine and treatment. Segregation is recognized a failure; moral preaching is ineffective and accomplishes naught. Its prevalence and spread cannot be limited without waging war upon it according to methods that have been demonstrated to attain results in combating other infective and pestilential diseases. This law enables the employment of public health eradication and prevention methods to be instituted. It prepares the way and provides a means. While it is true it will work a hardship on some, nevertheless, its beneficial results will exceed any temporary discomforts.

The time consumed in reporting the cases is negligible—no more so than in tuberculosis, smallpox, typhoid or the other reportable diseases. If the great objection is that one is not renumerated for making this report we dare say the Board of Health will provide a fee. The prohibition of dispensing by physicians is not worthy of argument for it is vastly recompensed by the prohibiting of counter prescribing and dispensing by drug stores. The "C. V. D." on

prescription blanks and the name, address of patient and date is a trivial time consuming requirement. So what is there to "kick" about or object to?

We recommend that the objectors inform themselves of the plans that are being made by the U. S. Public Health Service and the work that that service is already doing to limit the spread of venereal disease. We urge that they familiarize themselves with what was done in the army and navy and the ends that were attained. We urge that they write Dr. Byington of our State Health Commission and secure informative data as to the work that has been done in Michigan in the past two years. Then, if after digesting that information one still remains antagonistic, we recommend that a visit be made to the quarantine wards of several hospitals. We are sure that a change of heart will occur and cause for objection will disappear.

We would regret sincerely any obstructive methods from the organized profession of Michigan. We bespeak whole-hearted co-operation to Health Authorities in their administration of this law.

We append a concise statement of the law, extracted from the Bulletin of the Wayne County Medical Society.

C. V. D.

The editor is indebted to Dr. Don M. Griswold, Director of Medical Service, Board of Health, for the following excellent abstract of the recent venereal law. Learn it and file it for reference.

It is hoped that all the members of the W. C. M. S. will co-operate and abide by the law, thereby helping to reduce the number of syphilitics in Detroit to below 100,000.

Section 1—Syphilis, gonorrhea and chancroid are infectious diseases.

Section 2—(a) The State Department of Health will make rules and regulations to prevent the spread of these diseases.

(b) Blanks for reporting cases will be furnished to physicians upon request.

(c) All cases of the diseases must be reported. These reports are not to be public records.

Section 3—(a) The State Department of Health is to provide treatment in proper institutions for such cases.

(b) Cases under treatment in institutions shall be deemed to be in quarantine.

Section 4—(a) A physician who fails to report a case is subject to a fine of \$1,000.00 or

imprisonment in the county jail for one year, or both.

(b) Any person who shall break quarantine for venereal disease shall be subject to a fine of \$1,000.00 or imprisonment in the county jail for one year, or both.

Section 5—(a) No druggist or pharmacist shall give or sell any drug or medicine whatever for the treatment of syphilis, gonorrhea or chancroid.

EXCEPT

on a prescription.

(b) This prescription must bear:

1. Name of the patient;
2. Address of the patient;
3. Date of writing;
4. Date of filling;
5. The letters "C. V. D."

(c) These prescriptions shall be numbered consecutively and shall be kept on file for at least two years.

(d) This file of prescriptions shall be subject to inspection by the

Prosecuting Attorney;

Commissioner of Police;

Commissioner of Health;

or their authorized representatives.

(e) Druggists must make detailed monthly reports to the State Department of Health of all such prescriptions.

(f) No person shall treat another for syphilis, gonorrhea, or chancroid *except that* duly registered physicians may give office treatments.

(g) Violations of this section by druggist or physician may be sufficient reason to revoke their license and impose a fine of \$1,000.00 and imprisonment for one year in the county jail.

Bristles.

The world at large has just been let in on the secret that the 8 hour day is too long and will soon be a thing of the past and it has even been doped out that production will not only NOT suffer thereby but increase.

We merely mention the above to bring to your attention the extremes to which "organization" can be carried, for the little old law of average tells us that it can't be done. Aside from this, we all must admit that the organization of labor is so nearly perfected that they can almost put over anything and get away with it.

Don't think that we advocate any radical movements by the medical profession, a body that stands "head and shoulders" above any other class of professional or vocational men. What we do mean, though, is, if "day labor" can secure the "Life of Reilly" for its cohorts, then the medical profession, co-operatively, can, at least, get to the point where they can command their own self-respect and make humanity recognize them as men and not as a necessary evil.

This can't be done by thinking, wishing or grousing, but it can be accomplished by one grand "get together" policy. We can't hope to promulgate the eighth wonder by lining up the physicians nationally but we can give them a wonderful start by putting Michigan out in front in the getaway.

The first horse under the barrier always has the choice of the rail and with any kind of leadership continues to show the way.

It may be wrong to try to create a simile between the question that is as vital to us as life itself and a horse race, for victory won't come in one lone heat, but we can by concerted effort raise a cloud of dust that will make the has beens anxious to find out the cause of it.

Get your bet on the rail horse and back him to the limit.

Rome wasn't made in a day but the Bolsheviks put in their appearance soon afterwards.

The Boston police, in their recent strike, evidently overlooked the fact, that few people, in the present reign of old H. C. L., consider a "copper" seriously.

The conclusion seems to have been reached by the coal miners that it is better to suffer with the suffering, than have the comforts with the comfortable.

The "Sky Pilot," who recently won the trans-continental aero race, proved beyond a doubt, that the best of preachers must come down to earth occasionally.

The Peace Treaty, ratified by a sufficient number of European powers, became effective last month. Who said anything about a "Scrap of Paper?"

We've heard so much about making the world safe for Democracy. Wouldn't it be fine if some real good samaritan made it safe for Mr. Ordinary Citizen?

Yes, now there is a fuel administrator, a food administrator, and what not. What we need most is a common sense administrator.

By way of variation, don't it seem reasonable that the public might do better, than at present, by voting on who shall NOT be in Congress?

What are we going to do for consuls and ambassadors in the near future, if it costs a man \$150,000 to stay on his job in a "spiky" country? That sure is H. C. L.

"HOG."

MEDICAL EXTENSION.

We are in receipt of a communication from the Secretary of the American Medical Association requesting information as to what was being done in Michigan in the movement that is being developed to provide opportunity for medical extension among our members. We were compelled to reply that up to now Michigan had given no consideration to the subject. The need of undertaking such work is apparent and should be discussed and plans developed without further delay.

Illinois, Ohio, Wisconsin and several other states have such courses. The general plan being to hold one, two or three day meetings and clinics in several localities in a state. Definite subjects are covered—fractures, obstetrics, physical diagnosis, heart and kidney diseases, etc. In selecting lecturers care is exercised to designate men who are known and who possess specialized information on the branches they cover.

We all are aware that the scientific practice of medicine today requires constant study. We also know many doctors find it impossible to devote the time or to assume the expense entailed in studying at a clinic or medical center. As a result the percentage is small of those who avail themselves of the opportunity of becoming familiar with scientific development. With a view of bringing such opportunity to all these extension courses are provided.

We do not hesitate in stating that such a plan should be developed in Michigan. Tentatively

we suggest that the following locations should be designated as clinical centers: Detroit, Flint, Saginaw or Bay City, Cheboygan, Traverse City, Muskegon, Grand Rapids, Lansing, Benton Harbor, Kalamazoo, Niles, Jackson, Ann Arbor, Alma and possibly one or two other accessible places in the lower peninsula. In the upper peninsula we suggest Sault Ste. Marie, Marquette, Houghton, and Menominee.

It is our duty to inspire and encourage the raising of the standard of practice and induce research work. We must also bend our support to preventative medicine. As an organization we are obligated to acquit ourselves of that duty. The providing for an extension course of lectures and clinics will enable us to achieve that end.

To do so requires support and co-operation. We are asking our members for an expression of opinion on this plan. Will you not write us and thus let us have the benefit of your advice?

Editorial Comments

County Secretaries are urgently requested to make a diligent effort to secure the prompt payment of the 1920 annual dues. A systematized notification to all members that their 1920 dues are now payable and also a repeat notice or personal solicitation at your meeting will do away with a prolonged demuring campaign. We also urge our members to promptly pay their dues and thus lighten the work of your secretary.

A snow bank is a poor financial depository, so too are second rate proprietary organizations or industrial concerns who promise much but deliver nothing.

When a detail man enters your office and wishes to consume your time ask him if the preparation has the approval of the Council of Pharmacy of the A. M. A. and if it hasn't don't waste any time on him. If you have an inclination to "horse" him a little get posted by sending to the A. M. A. for a copy of New and Accepted Preparations and then show up his subterfuging excuses.

Our maternal clinics are accomplishing commendable results. As their work broadens our viewpoint also widens and we focus our eyes upon heights of greater achievements. We must provide better facilities and care for the mother during labor. We must surround them with greater safety during the lying in period. We must guard the infant against preventable injuries of birth. Therefor maternal clinics are not suf-

ficient; what is needed are more, larger and better maternities. Their endowment is to be sought with greater avidity.

In this present day one hesitates to speak dogmatically. It isn't safe, for what may be the dogma of today may prove to be the fallacy of tomorrow. We can only see the one step ahead and even that must be taken cautiously. To plunge forth blindly and hope to land on both feet, erect and unruffled is courage personified—almost heroism. Therefor in this coming year we should resolve to take definite steps forward; make each step count and thus at the end find ourselves in the advancing platoon and not in the ranks of the distanced.

If silence is golden our members must indeed be enshrined in a coat of gold, or, they are content to plod their way in solitude. We welcome, even faint ripples, of interest in the affairs of the profession, collectively and individually. We solicit discussion of the problems of state, institutional and individual medicine and practice. We plead for active interest and participation in organizational activity. Are we awake or only awaking? May we not be greeted by a responsive note of personal and local comments? We urge the shedding of our "Coats of gold" and a budding forth in a "stripped for action" vestment—mentally and physically.

What we want to know and what other societies want to know is what are you and your associates doing in the solution of the problems of: trained and practical nurses, public health problems, hospitalization, clinics, industrial medicine, specialties, and those other subjects that concern the profession?

The minutes of the Annual Meeting of the Council and the Secretary-Editor's annual report will be published in the January issue.

For several months past practically every medical publication has contained one or more articles dealing with war surgery, its principles, and the results attained. It is still too early to draw definite conclusions or to pronounce adverse criticism. Statistical end results are not yet obtainable. There are certain definite principles however, that give promise of becoming established procedures providing they are applied with scientific accuracy and skill. The point we wish to make is that in reading and studying this literature which is piling up we should be alert to the grasping of how these military procedures may be adapted to civil practice and in emergency and industrial surgery. We must not fail to derive permanent benefits from the experiences gained in military hospitals. Then, too, we must not be too eager to condemn. One must be sure that he understands thoroughly a given procedure, that he has accurately and skillfully applied its prin-

principle in every exacting detail and lastly, that he is not basing conclusions on experiences encountered in isolated or scattered cases. There is much that is good and much that is bad—it behooves us all to not run off on a tangent—an observing, studious, practical attitude must characterize our positions when we discuss military surgery. But by all means let us not lose any of the lessons to be learned. We must attain practical application.

We again wish to remind our members of the necessity of making reports to the State Board of Health of all cases of venereal disease coming to them for treatment. The law now is in force making them reportable. A similar law applies to tuberculosis. Then, too, do not forget the new law that makes it a felony to divide or split fees and that conviction brings about revocation of license to practice in Michigan.

Lessen the labor of your County Secretary by promptly remitting to him your 1920 dues.

The Council of Pharmacy of the A. M. A. has done a magnificent piece of work wholly and solely for the benefit of the public and the doctor. It merits your support and is entitled to it. You cannot afford to cast reflection by not observing its recommendations. Your persistence in using unapproved preparations is unappreciativeness, courtesy and is abetting a most unprincipled practice of certain manufacturers. We urge every Michigan doctor to be alert to the work of the Council and subscribe their personal support.

In spite of all this social and labor unrest—if we go at it in the right way we can all have a happy new year.

A little more contentment and a little less of this rush for profit will go a long way towards stabilizing things in general. One thing is certain and that is the pace is far too fast for human resistance—something is bound to break soon.

Our Committee on Social and Industrial Relationship under the Chairmanship of Dr. Frothingham is actively at work. We bespeak every support for any assistance this Committee may call for from our County Societies. Incidentally we trust our other committees are also active.

The index for volume XVIII which is completed with this issue is published elsewhere in this issue. The preservation and binding of each volume will give one a reliable record of the history and progress of medicine and the profession in Michigan.

Attention is directed to the communication of Dr. Vaughan published under News Notes. The organization of a Michigan Chapter of Medical

Officers of the war depends upon an expression of desires of our returned officers. The Journal will gladly publish such expressions.

Full support is subscribed to the movement to deport objectors and agitators who seek to attack and destroy our government. Let him who is dissatisfied "hit the trail to Russia." No room, no tolerance, no mercy for him if he attempts to remain in America. If he fails to depart of his own accord let him be "kicked out." Socialism, I. W. W.'s and Bolsheviks must be muzzled and crushed—we must all become identified with the movement that is directed towards their deportation. When labor organizations seek to dictate and defy our established courts and declare themselves greater than our government, their representatives, who utter such pronouncements, must be dealt with in the same manner as traitors have been punished in the past. What is needed, is more Americanism and less egotism of unions and factions, politics and politicians. We need all to rededicate ourselves to our country. We may well turn back to the preamble of our Constitution which our forefathers wrote and therein declared the purpose of our government:

"We the People of the United States, in order to form a more perfect Union, establish justice, insure domestic tranquility, provide for common defense, promote the general welfare, and secure the Blessings of Liberty to ourselves and Posterity, do ordain and establish this Constitution for the United States of America."

And then turn to the third article of the Articles of Confederation:

"The said States hereby severally enter into a firm league of friendship with each other, for their common defense, the security of their liberties, and their mutual and general welfare, binding themselves to assist each other against all force offered to, or attacks upon them, or any of them, on account of religion, sovereignty, trade, or any other pretense whatever."

If you ever were an American now is the time to show it. Now is the time when you too must aid in crushing out this spirit that prevails in antagonism to the principles of our nation, its purposes and its ideals. There is no room, no food, no shelter for anyone who defies or threatens to destroy your and my country and its laws. Send him or her back to where they came from. Imprison him or her who holds that they are above and beyond governmental authority. Let's have more men of the type of the Federal Judge of Indianapolis.

Miscellaneous Nostrums, in its fourth edition, as prepared and issued by the Propaganda Department of the A.M.A. is off the press. Its nominal price of 20 cents, barely covers the cost of publication. Every member should secure this compilation of exposures of fake preparations. The Propaganda Department of the A.M.A. is accomplishing a most commendable work and merits the support of every doctor. Get this book, read it, put it on your reception table. Secure a couple of extra copies to give to your lay friends.

In this day of more or less pessimism it is refreshing to run into an optimist. We found one the other day—he was still carrying an "opener" on his key ring. We do not believe it was still carried as memento—especially in Michigan.

Please pay your dues promptly. Assist your County Secretary to that extent at least. Don't force him to become a dunning collector.

Deaths

Dr. George Duffield.

Doctor George Duffield, life long resident of Detroit, and a scion of one of the Detroit's foremost families, died suddenly Wednesday, November 12th, in his office from heart disease. He went to his office Wednesday morning in apparently good health and died suddenly at 12:45.

Doctor Duffield was a son of D. Bethune and Mary Strong Duffield. He was born April 29, 1859. He was educated in the Detroit Public Schools, Patterson's Private School and the Michigan Military Academy. He received his degree of Doctor of Medicine from the Detroit Medical College in 1882. He studied in Berlin, Heidelberg and Vienna. Since that time, he has practiced in Detroit.

For the last several years, he has been Michigan Medical Director for the Mutual Benefit Life Insurance Company of New Jersey. He was Professor of Clinical Medicine in the Detroit College of Medicine and Surgery and a member of the following medical societies, Detroit Academy of Medicine, Wayne County Medical Society, Michigan State Medical Society and the American Medical Association. He belonged to the following clubs, Detroit Golf Club, Detroit Boat Club and the Country Club. Politically the Doctor was Republican. He was a member of the First Presbyterian Church of Detroit.

In 1888, Doctor Duffield married Clara W. Cowie. They have three sons, George Bethune, Henry Cowie, and Frederick Hodges Duffield. Bethune Duffield is his brother and Divie and Doctor Francis Duffield are his cousins.

State News Notes

COLLECTIONS.

Physicians' Bills and Hospital Accounts collected anywhere in Michigan. H. C. VanAken, Lawyer, 309 Post Building, Battle Creek, Michigan. Reference any Bank in Battle Creek.

THE SAMUEL D. GROSS PRIZE—FIFTEEN HUNDRED DOLLARS.

The conditions annexed by the testator are that the prize "shall be awarded every five years to the writer of the best original essay, not exceed-

ing one hundred and fifty printed pages, octavo, in length, illustrative of some subject in Surgical Pathology or Surgical Practice, founded upon original investigations, the candidates for the prize to be American citizens."

It is expressly stipulated that the competitor who receives the prize shall publish his essay in book form, and that he shall deposit one copy of the work in the Samuel D. Gross Library of the Philadelphia Academy of Surgery, and that on the title page it shall be stated that to the essay was awarded the Samuel D. Gross Prize of the Philadelphia Academy of Surgery.

The essays, which must be written by a single author in the English language, should be sent to the "Trustees of the Samuel D. Gross Prize of the Philadelphia Academy of Surgery, care of the College Physicians, 19 S. 22d St., Philadelphia, on or before January 1, 1920.

Each essay must be typewritten, distinguished by a motto, and accompanied by a sealed envelope bearing the same motto, containing the name and address of the writer. No envelope will be opened except that which accompanies the successful essay.

The Committee will return the unsuccessful essays if reclaimed by their respective writers, or their agents, within one year.

The Committee reserves the right to make no award if the essays submitted are not considered worthy of the prize.

William J. Taylor, M.D.,
John H. Jopson, M.D.,
Edward B. Hodge, M.D.
Trustees.

MEDICAL VETERAN'S OF THE WORLD'S WAR.

An Association bearing the above title was formed in Atlantic City, June 12, 1919. All physicians who were on active duty during the war in one or the other of the federal services are eligible. Army, navy, public health service men and medical members of the local advisory boards under the Selective Service law are also eligible. The object of the Association is to perpetuate fellowship, to prepare history, to secure co-operation for the mutual benefit of the medical men who served in the World War, and for the mutual improvement and social intercourse of its members.

It is believed that some good to Medicine and Surgery has come from the experience of our allies and ourselves and in order that this good may not be lost we believe a large and powerful organization should be formed to perpetuate the fellowships, to continue the patriotic devotion to duty, and to serve our country in peace as well as in war.

The Secretary-Treasurer of this Association is Colonel F. F. Russell, Army Medical School, Washington, D. C. It is to be hoped that every Michigan medical man will join this organization. The Executive Committee had a meeting in St. Louis, Missouri, October 12. Up to that time,

2,200 members had completed their membership. The dues are one dollar (\$1.00) a year. Send to Colonel F. F. Russell for an application blank.

Victor C. Vaughan,
President, Medical Veterans of the World War.

The Detroit Medical Club held its first meeting of the fall on Thursday evening, October 16, 1919, in the Wayne County Medical Society building. There was a good attendance as all the members have returned from War Service.

Dr. Don M. Griswold presented as the paper of the evening "The Study of 1,000 Cases of Diphtheria in Detroit." The average dose of antitoxin recommended was 20,000 units for milder cases, 40,000 for more severe cases while 60,000 had been used in the worst cases. He recommended immunization only in such cases as did not favorably respond to the Schick test. For immunizing purposes the latest method was declared to be the administration of small doses of diphtheria toxin combined with moderate doses of antitoxin. By this means it has been found that immunization for at least five years is obtained.

The next monthly meeting will be addressed by Dr. A. S. Warthin of Ann Arbor, the topic being "Syphilis of the Lung."

AMERICAN MEDICAL SCHOOL IN PARIS.

The project for the establishment of the American School of Medicine in Paris took definite shape at the meeting held recently in the office of Charles F. Beach, an American lawyer in Paris. In addition to a number of laymen, Drs. Tuffier of the Academy of Medicine, Dehelly, Alexis Carrel, Edmond Boret, and other noted physicians and surgeons of Paris were present. The new school is to be entirely postgraduate in character, and will be under the joint direction of American and French physicians.

SIX YEAR'S COURSE REQUIRED.

With the opening of the session 1919-1920 of the medical department of the Western University, London, Ont., the course of medical studies

will be six years, excepting that those matriculants who left for overseas service will be on the five-year plan. Toronto and Queen's Universities now pursue the same plan.

The following Michigan doctors were made Fellows of the American College of Surgeons: Drs. Bruce Anderson, W. E. Blodgett, John K. Gailey, E. C. Hoff, C. F. Kuhn, G. F. Parmerlee, G. C. Pemberthy, W. A. Repp, W. J. Seymour, C. M. Stafford and W. E. Weltz.

Harper and Grace Hospitals of Detroit have been placed on the accepted list of hospitals of the American College of Surgeons.

St. Joseph County has started off with new vim on a series of meetings after having been somewhat dormant during the war.

Dr. Karl H. Kellogg, Dr. R. H. Harris and Dr. C. M. Mercer have opened joint offices in Battle Creek.

Dr. Bertrand L. Jones has opened offices in the Kresge building, Detroit.

Dr. Wesley W. Wilson of Detroit has located in St. Clair.

Dr. Morrill of Big Rapids has located in Painsdale.

Dr. H. C. Miller of Hillsdale has been elected county physician.

Dr. Wm. Westrate has located in Holland.

Dr. James H. Quick has located in Houghton.

COUNTY SOCIETY NEWS

It is the Editor's desire to have this department of the Journal contain the report of every meeting that is held by a Local Society. Secretaries are urged to send in these reports promptly

BRANCH COUNTY.

Our county medical society held its regular quarterly meeting on the 21st inst at Library Hall in this city. It was an occasion for welcoming home our professional brethren, Dr. Bien and Dr. Griffith, late of the medical service in the U. S. A. The former read a paper on the medical examination of recruits in the army and the latter gave an oral account of his experience in the service.

The Secretary read a summary of the provi-

sions of the bill relating to venereal diseases and while admitting the excellence of some of its features expressed doubt of the act being practical unless the profession as well as the community co-operate. That view was sustained in the discussion which followed. The general opinion was that as soon as the provisions of the bill become public venereal cases would drift into the hands of irregulars and quacks, thus defeating the end for which the bill was intended.

G. H. Moulton, Secretary.

GENESEE COUNTY.

Annual meeting of the Genesee County Medical Society held in the Dryden Cafe at noon luncheon on Wednesday, October 22, 1919.

Meeting called to order by President O'Neil.

Secretary's annual report:

Number of meetings including annual picnic	13
New members taken in during the year	10
Lost by death during the year	2
Transferred to Wayne	1
Total membership	106
Members that volunteered for Gov. service..	27

Respectfully submitted,

D. D. Knapp, Secretary.

Treasurer's annual report:

Cash in bank January 15, 1919 ..	\$ 45.30
Total receipts	743.85

Total disbursements	\$ 789.15
	711.36
Balance in bank	\$ 77.79
Total membership	106
Total paid dues	72
Total received army credit	27
Transferred	1
Delinquent	6

Respectfully submitted,

A. A. Patterson, Treasurer.

Ballots were prepared and the following officers were elected for the ensuing year.

President—H. E. Randall.

Vice-President—W. H. Winchester.

Secretary—W. H. Marshall.

Treasurer—E. D. Dimond.

Medico-Legal Officer—F. B. Miner.

Directors—C. H. O'Neil (long term).

T. S. Conover (short term).

Delegate—J. C. Benson.

Alternate—F. E. Reeder.

Dr. John Hornsby of Munseyville, Washington, D. C., was introduced and explained in detail the plans for the new hospital proposed for Flint.

Moved and seconded that the Genesee County Medical Society endorse the proposed new Charter for Flint.

Carried unanimously.

Moved and seconded that Dr. Hornsby be elected to honorary membership in the society.

Carried.

Meeting adjourned.

D. D. Knapp, Secretary.

GRATIOT-ISABELLA-CLARE COUNTY.

The annual banquet for the members and their wives was held in the Republic dining hall in Alma Tuesday evening, Nov. 18. Covers were laid for 40 but only 29 attended. Music was furnished by the Republic orchestra.

President Baskerville was in his usual happy vein as toastmaster, and called on the following: Dr. I. N. Brainerd, The Doctor; Mrs. C. E. Burt,

a reading; Dr. S. E. Gardiner. The Doctor's Diversions; Dr. E. H. Foust and W. E. Barstow, vocal selections.

The eats were good, the music was better, the toasts were best. The general feeling was these events are too far apart. Perhaps we will have them oftener next year.

E. M. Highfield, Secretary.

The October meeting of the Gratiot-Isabella-Clare County Medical Society was held at Brainerd Hospital, Oct. 16. Dr. Merrill Wells of Grand Rapids was the guest of the day. The Doctor talked from notes on Cerebro-spinal Meningitis. He went into every branch of the subject thoroughly, history, etiology, pathology, bacteriology, especially in relation to the diagnosis by examination of the spinal fluid, and the treatment by intra-spinal and intravenous injections of Flexner's serum. Altogether the doctor gave a very scholarly presentation of the subject which was appreciated by everyone present.

By motion it was decided to have our annual banquet next month.

E. M. Highfield, Secretary.

KALAMAZOO ACADEMY OF MEDICINE.

Regular meeting of the Kalamazoo Academy of Medicine was held October 28, 1919, with President Dr. F. C. Penoyer presiding.

The following scientific program was carried out:

1. "Experiences with Rockefeller Yellow Fever Commission in Ecuador."

Dr. Charles A. Elliott, Chicago.

2. "When to Interfere in the Toxemias of Pregnancy."

Dr. Charles B. Read, Chicago.

B. A. Shepard, Secretary.

MONROE COUNTY.

Meeting held at Monroe November 6, 1919. Sixteen members being present.

This meeting was held in conjunction with a tuberculosis clinic conducted by the Michigan Anti-Tuberculosis Association and the Monroe County Tuberculosis Society.

The chest examinations were done by Dr. E. R. VanderSlice, and Dr. Wm. R. Vis of Grand Rapids.

Program.

Neurology and Psychiatry of the War. Dr. C. W. Hitchcock, Detroit.

Tuberculosis Clinic.

Luncheon at the Park Hotel.

O. M. Unger, Secretary.

SANILAC COUNTY.

A meeting of the Sanilac County Medical Society was held in the town hall, Marquette, on Wednesday, Oct. 8, at two o'clock p. m.

Dr. E. K. Cullen, Detroit, and Dr. B. E. Brush, Port Huron, were the speakers.

Dr. Cullen gave a very able and interesting talk on "Some Differential points in Pelvic Diseases" which elicited considerable discussion.

Dr. B. E. Brush gave a very instructive and lengthy talk on "Diseases of the Gall Bladder" which also elicited much discussion.

A unanimous vote of thanks was tendered Drs. Cullen and Brush for their courtesies.

Three new members were admitted to the Society at this meeting.

We were pleased to extend a welcome to the visiting members present from St. Clair, Lapeer and Tuscola Societies. Come again, boys, a hearty welcome awaits you to any of our meetings.

J. W. Scott, Secretary.

Book Reviews

A MANUAL OF HYGIENE AND SANITATION. By Seneca Egbert, A.M., M.D., Professor of Hygiene, University of Pennsylvania. Seventh Edition, illustrated, 553 pages, cloth. Lea & Febiger, Philadelphia. Price, \$3.00.

A seventh edition attests the work and value of this text. Splendid in the manner in which the text covers the subjects that discussed, with illustrations that enhance the text—the volume is a comprehensive treatment of the subject.

EXPERIMENTAL PHARMACOLOGY. By Hugh McGingan, Ph.D., M.D., Professor Pharmacology, University of Illinois. Illustrated, cloth. 248 pp. Lea & Febiger, Philadelphia. Price, \$2.75.

This is an excellent manual that presents experimental pharmacology in a brief and concise form. An adequate view of the field is presented.

Miscellany

TREATMENT OF JOINT, BONE, NERVE AND MUSCLE INJURIES BY MECHANICAL MEANS.*

Joseph C. Scal, M.D.
New York, N. Y.

In sprains the sooner mechanical treatment is instituted the more rapidly a normal condition can be obtained. After resting the injured part and applying cold applications for 24 hours, active and passive treatment, consisting of exercise and massage, should be begun. No pain accompanies proper movement; the presence of pain is an indication motion should be stopped temporarily. This treatment can do no harm as there is no danger in exercising and using a sprained limb, in fact it tends to restore function to muscles and joints, reduce swelling and edema, promote absorption, and prevent adhesions, no matter how slight the injury may have been.

In cases where the relief of swelling is neces-

sary during the first 24 hours a bandage applied firmly and evenly over a number of layers of absorbent cotton will obtain the desired result by preventing further extravasation and promoting absorption in from 6 to 8 hours. This treatment should be used only in the first 24 hours after the injury. In cases where the confidence of the patient cannot be obtained so as to make him co-operate in exercising and using his limb, strapping is the next best thing.

Fractures—The ideal treatment of fractures consists of reduction and the x-ray; prevention of recurrence by splintage; relief of pain and elimination of edema by early baking and gently massage, and the prevention of adhesions and muscular wastings by graduated contractions. Early bakings, light massage and passive movements will shorten the period of disability and length of treatment and prevent after effects, provided good union and good apposition exist; will prevent adhesions and stiffness in joints; reduce atrophy of muscles to a minimum and prevent excessive callus. When a fracture is near a joint and kept immobilized in splints until union is firm, the joint will become stiff and muscular atrophy will result. In these cases it is advisable to remove the splints as early as possible and institute baking, massage, and the various mechanical movements.

Nerve injuries—Especially in peripheral nerve injuries weakness and muscular wasting inevitably result and these are followed by paralysis and contractures. When nerves are cut the joints should be kept free and the nutrition of the muscles around them maintained so that the joint will be able to functionate when the nerve recovers. If a severed nerve is sutured, which should always be done if possible, it must be held in position which will produce as little tension as possible on the nerve or paralysed muscle until its function is restored.

Treatment by Heat—An affected limb should be kept warm and protected from cold. Heat also makes a treatment by massage and electricity more effective and should be applied before and after such treatment when possible.

Treatment by Massage—To be effective massage must be gentle at the beginning, all movements must be painless and should be applied daily from the early stage.

Treatment by Exercise—This is used for re-educating and redeveloping wasted muscles and consists of active exercise against resistance. For a shoulder joint with limited movement the so called "wall climbing" exercise is advised. This consists in the patient standing with his face against a wall or door, and putting the hand of the affected side as far up as he can, endeavoring to place the finger tips on the top. When he reaches the top he fixes the hand with the other well hand and bending knees slightly uses his body weight to exert a pull on the joint.

Treatment by Graduated Contractions—This is ideal routine for muscular wasting and muscular insufficiency, and no matter how wasted a muscle is, provided the nerve supply is undisturbed, a contraction can be obtained. It should be given daily from 10 to 15 minutes together with

*New York Medical Journal, Vol. CX, Whole No. 2122, No. 5.

gentle massage. It is indicated principally in sprained muscles. The method of application is to place the limb at absolute rest, and apply the faradic current, the degree of contraction being controlled by the manipulator, and a group of muscles is stimulated while in absolute relaxation.

In conclusion I would say that a stiff and crippled part can be restored to functional utility only by getting rid of adhesions, restoring mobility and rebuilding the muscular tissue which has been permitted to waste and atrophy. With the early application of the forms of treatment outlined here we will see fewer stiff joints and wasted members than we have seen in the past.

**TREATMENT OF PURULENT ARTHRITIS
BY WIDE ARTHROTOMY FOLLOWED
BY IMMEDIATE ACTIVE MOBILI-
ZATION.***

C. Willems, M.D.
Ghent, Belgium.

No therapeutic law has been more firmly established than that which has made immobilization obligatory for every joint injury, from the mild to the most severe. Nevertheless we all know its consequences; muscular atrophy which is rapid for certain muscles such as the femoral quadriceps, and stiffness of the joint. Also we know that such complications when once established are extremely tenacious and that frequently they do not yield completely to varied and very prolonged physiotherapeutic treatment. Even in the more fortunate cases it is necessary to continue such treatment for some months before getting the required results. Immobilization has been considered a necessary evil.

I have freed myself by degrees from practicing the law of immobilization. I commenced evacuatory punctures to drain traumatic effusions of the knee, hemarthroses and hydarthroses, and by making the patient walk immediately. Not only could they do this without any difficulty but their lesions cured in a few days without leaving any trace.

Since the war the great frequency and infinite variety of articular lesions gave me the opportunity of applying this new method on a large scale. In the simplest and most severe conditions I have used immediate active mobilization after the operations for penetrating joint wounds with or without an included projectile and for all varieties of intra-articular war fractures. I have not confined myself to non-infected fresh cases. I have also treated cases of purulent arthritis and it is perhaps in these difficult infected cases that the method has given the most astonishing success. But the object pursued differs. In simple lesions immediate active mobilization obviates atrophy and ankylosis. In purulent arthritis it seeks out the contrary to drain the articulations. In the first case the joint must be completely closed; in the second it must be left widely open.

A word as to the technic. It is practically the same whether the wound is aseptic or infected. In the case of recent injuries we commence by exercising the soft parts of the wound, proceeding with the eventual esquillectomy of the fracture area, extracting projectiles and hermetically closing the joint. In purulent arthritis on the contrary; we must first execute an arthrotomy and leave the wound largely open. But starting from this movement we always proceed in the same way for mobilization.

The expression "immediate active mobilization" must be taken in its literal sense. The mobilization must be active, that is to say, made by the patient himself by muscular contractions. The movements ought to reproduce the essential normal movements: Extension, flexion and rotation. The goal to be reached is to restore the physiological function of the articulation as much as possible, and in the case of the knee this function is walking.

Active mobilization cannot in any way be replaced by a passive mobilization, which does not call into play either the muscles of the limb or its nutrition and which tends to restore mobility alone.

Mobilization must be immediate, that is, commenced as soon as the patient awakens from the anaesthetic. The patient must not be permitted to rest. The movement must be pushed to the maximum in every direction and must be kept up, so to speak uninterruptedly. He needs supervision by a personnel in touch with the necessities of the treatment.

Active mobilization is always possible. It becomes more or less easy according to the extent of the lesions, the courage of the patient and his aptitude in directing his efforts to the muscles which must be contracted and not wasting his strength in contracting other muscles than those necessary. Movements become easy accordingly as they are repeated.

Active mobilization is not painful in the true sense of the term, except when it displaces large bone fragments and in such a case it is contraindicated. But the movements are laborious and call for effort. It is found that a patient treated by active mobilization uses his limb in a variety of non-prescribed ways which he would not employ if the movements were painful. Many have stated that when a little pain is felt in periods of rest the best way of stopping it is to resume movements.

Active mobilization gives the most surprising results in purulent arthritis. I do not hesitate to assert that against this formidable infection the new method is more efficacious than any of other means hitherto at our disposal.

In applying mobilization to the treatment of articular suppurations, my chief aim was to realize a satisfactory drainage after arthrotomy. We know that efficacious drainage of a joint by the ordinary means is an utopia. No kind of tube, no system of tampons, no means of irrigation, obviates retention nor stops the progress of infection. And it is on account of this insufficiency of drainage that arthrotomy has been

*Vol. XXVII, June, 1919, No. 6. Surg. Gyn. and Obs.

almost abandoned and replaced by resection. But I have always been under the impression that to resect for the purpose of drainage alone is to go too far; and I have endeavored to empty the joint by expression, thanks to active movements. When a suppurated articulation has been opened by a large uni—or bilateral arthrotomy (an arthrotomy is never necessary) this is what is observed: At each extension and at each flexion the synovial surfaces are forced together by muscular contraction and pus is expressed often in the form of a jet. When the movements are very extensive and the muscles contract more vigorously the expression of pus is so much the more complete. If the movements are repeated a sufficient number of times the secretions are eliminated in accordance with the movements, retention is prevented and articular drainage profoundly influences the local and general conditions. Locally, suppuration evolves like an ordinary abscess, but slowly. It lasts for a few weeks abundant at first, then less and finally disappears completely. During this period, the arthrotomy opening or openings cicatrize. A species of fistula persists which closes from time to time and must be periodically opened. Oedema of the peri-articular tissues diminishes very rapidly and the tissues remain supple. Peri-articular abscesses are, so to speak, unknown.

With regard to the general state it is rapidly modified. From the commencement of active mobilization fever falls, not completely, as the patient may show 38 degrees C. for some time. But the feverish aspect disappears, such patients do not look like badly infected cases.

Drainage is therefore realized in an ideal manner without a tube, and without irrigation of any kind. I am of the opinion that irrigations are more harmful than useful.

Drainage was my aim at first but I obtained more. I have obtained preservation of the articular mobility. Unquestionably we must consider the recovery of a purulent arthritis with ankylosis as satisfactory, and be thankful that the patient has escaped resection. But it is evident that a mobile joint is much better than the best kind of ankylosis.

If the procedure is followed in the manner indicated, mobility of the joint will always be preserved. From the moment suppuration notably diminishes we sometimes see a tendency to stiffness. This is why I now partially and progressively close the arthrotomy wounds from this moment, and only leave such openings that are strictly necessary for the discharge of pus which is still forming. Proceeding in this way, mobility will be perfect and absolutely normal in the great majority of cases, no matter what the causative microbe may be. The limb will show no functional disturbance after an infection as terrible as purulent arthritis was formerly considered.

In purulent arthritis still more than in non-infected lesions it is difficult to realize the possibilities of active mobilization. It is so contrary to classical ideas that we must see the patients move their limbs in order to understand. The

truth is that movements are perfectly possible in purulent arthritis treated by arthrotomy, to the same extent as in non-infected articular lesions treated by incision of the damaged tissues and total primary sutures. Movements are no more painful in the first place than in the second. They are equally laborious in the two cases. True pain appears only when the drainage is insufficient; and when it becomes necessary to drain more completely to cause an immediate cessation of pain. Whenever a patient complains of pain, especially in the politeal space, it is almost certain that there is retention. The patients themselves soon learn to recognize this cause of pain and stop it by means of some movements.

Patients with purulent arthritis of the knee can walk early, even before cicatrization of the arthrotomy wound. It is the same with purulent tibiotarsal arthritis. It is a curious experience to see them walk with the joint widely open, expelling a little pus at each step.

With regard to the question whether immediate active mobilization is applicable to cases in which purulent arthritis accompanies an intra-articular fracture, it can be answered affirmatively. As in non-infected lesions mobilization can be effected in purulent arthritis with fracture on condition that there is no fear of displacing the fragments. If there is, movements are contraindicated because they might dislocate the joint.

A second circumstance which renders this method inapplicable is primary destruction of the ligaments and of the articular capsule. When the means of union have disappeared it is evident that the joint can no longer be mobilized by muscular contraction. But it is well to know that a partial destruction of the means of union does not render the treatment quite inapplicable.

On account of the great value of this paper, it has been abstracted very fully.

MENTAL DEFECT IN GEORGIA.

(Mental Hygiene, Oct., 1919, V. V. Anderson).

Summary.

Forty per cent. of inmates of the almshouses investigated were feeble-minded.

A study of a typical orphanage showed that 28.7 per cent. of the children were feeble-minded. If the same percentage exists in the other orphanages of the state, then there are at least 810 feeble-minded children in orphanages who need special care and training in a school for the feeble-minded.

Seventeen and five-tenths per cent. of the male inmates of the state-prison farm were feeble-minded. Sixty-five and eight-tenths per cent. of the inmates of this institution are classifiable in terms of deviation from normal mental health. Of the women inmates of the prison, 42.8 per cent. were found to be feeble-minded. In the two typical county jails examined, 34 per cent. of the inmates were feeble-minded.

Of 122 immoral women examined, 43.5 per cent. were found to be feeble-minded. The present policy of treating these feeble-minded girls for venereal disease and then turning them out into the community to acquire it over again is a costly one. Probably the greatest single factor in the spread of venereal disease is the feeble-minded prostitute. An institution for defective and delinquent girls and women is most urgently needed.

Of 100 cases of juvenile delinquents studied in the juvenile court, 17 per cent. were found feeble-minded. Fifteen per cent. of the Fulton County Reformatory for boys were feeble-minded, 24.1 per cent. of the inmates of the State Reformatory for Boys, and 27 per cent. of the inmates of the Georgia Training School for Girls. It is these feeble-minded delinquent children that later on become the chronic recidivists, as is seen in our jails, adult criminal courts, and state prisons.

Finally, 3.5 per cent. of the children examined in the public schools were found to be feeble-minded. These are the children who are to become the "grist" of our future courts, jails, reformatories, and state prisons, and to form the very backbone of the vast and grim procession of paupers, criminals, and prostitutes of tomorrow.

Recommendations.

1. Training School and Farm Colony for Feeble-minded Persons.

(a) Custodial Department.

This department includes the lower grades of idiots and epileptics. Some of these children are as helpless as infants, incapable of standing alone or of dressing or feeding themselves. The chief indication with these lower grade cases is to see that their wants are attended to and to make them comfortable and happy as long as they live; but even with these cases, much improvement is possible in the way of teaching them to wait on themselves, to dress and undress, to feed themselves and to give attention to personal cleanliness and habits of order and obedience. In this way, quite a large group, even of these low grade cases, may be made less troublesome, and the burden and expense of their care may be considerably lessened.

(b) The Training School.

Here manual training and other methods are especially adapted to the training of feeble-minded children. Dr. Walter E. Fernald has said "these methods of physiological training of the senses and faculties, of exercising and developing the powers of attention, perception, and judgment, by teaching the qualities and properties of concrete objects, instead of expecting the child to absorb ready-made knowledge from books, of progressively training the eye, the hand, and the ear, these were the methods formulated by Séguin," etc.

Dr. Fernald further says: "The most prominent feature of our educational training to-day

is the attention paid to instruction in industrial occupations and manual labor. In this 'education by doing' we not only have a very valuable means of exercising and developing the dormant faculties and defective bodies of our pupils, but at the same time we are training them to become useful men and women. Carpentry, painting, printing, brick-making, stockraising, gardening, dairying, farming, domestic work, the manufacture of clothing, boots and shoes, brooms, and brushes, and other industries are now successfully carried on by the pupils in these schools, in connection with the strictly mental training."

(c) The Farm Colony.

An essential part of this school for the feeble-minded is the farm colony that should be attached to it. A large proportion of the feeble-minded can be usefully and profitably employed, if intelligently directed. They can clear waste land, grub bushes, remove stones, build fences, make roads, renovate orchards, drive teams of oxen or horses, milk cows, feed pigs, take care of chickens, cultivate land, and gather crops. They can excavate for buildings, haul stones for foundations, make brick and cement blocks, and do the necessary painting to keep the buildings neat and attractive..

There is a stream nearby, they may go in bathing. The results of their labor become more evident. Where they make their own concrete blocks and construct their own buildings, they feel that they are really doing something worth while, and appreciate the fact that they are making their own home. The destructive tendencies often marked in the schoolroom find their outlet here. Instead of breaking windows, destroying furniture, or setting fire to buildings, as these children so often do when confined in penal institutions, they cut down bushes, pull up stumps, burn brush heaps, and make waste land available for farming, thus increasing its value and decreasing the cost of maintaining themselves as the wards of the state.

(d) Kind of Land and its Location.

Cheap land should be bought, with good water and drainage facilities—undeveloped land that can be made useful and valuable by clearing, draining, and preparing for cultivation. This work the feeble-minded can do. Barren or near-barren land must not be selected. The location should be far enough away from cities so that it can be purchased for its inherent agricultural value, but no so far as to be inaccessible. The more accessible the feeble-minded person is to his family and friends, when in the institution, the more readily will the latter consent to such care.

(e) Type of Buildings.

The feeble-minded can be economically housed if we discard the mistaken idea of elaborate buildings and equipment. At the same time, they can be made happy, useful, and contented. Simple buildings, not more than two stories high, of frame, cement, or cement block, may be used. It is probably more economical to build

with concrete blocks, where the boys can do a large part of the work themselves. The buildings should house from fifty to one hundred persons each. This presents the possibility of segregation of different types. Not only can the negroes be separated from the whites, and the boys from the girls, but the vicious and delinquent types from the more tractable types, the high-grade cases from the low-grade, the epileptics, etc.

(f) Medical Superintendent.

It is probably needless to add that, inasmuch as the innumerable problems confronting the superintendent of such an institution are so essentially medical in nature, having to do with the various physical and mental aspects of feeble-mindedness, only a physician trained in this particular field should be at its head.

2. Special Classes in Public Schools.

In every school district throughout the state, there are children who are not receiving educational benefit commensurate with the effort and money expended on them. These children are a drag on the classes. These backward children have just as much right to education as the normal child. This education can be made of the largest profit to the child and to society if it is directed along lines that will give him industrial training and habits fitted to his particular capabilities and adaptabilities.

Through the organization of special classes, the normal class and teacher are relieved of a drag. The retarded and slow children are encouraged and speeded up. The intractable children become interested in school work. The defective children are trained to do the things they are capable of doing. By proper correlation of the work of these special classes with the State Institution for the Feeble-minded, many of these children may be prepared for happy and useful lives under state supervision.

3. State-wide Supervision.

If these special classes in the schools are to be of the greatest service, then some plan of supervision and control of the feeble-minded is necessary. Are we to look after these defective children in the special classes in schools until they are fourteen, fifteen and sixteen, and then suddenly throw off all responsibility and turn them out into the community? The school and the special class furnish us with a nucleus for a system of supervision, enable us to detect early the feeble-minded child and to give him proper supervision or institutional care. If, now, there is accessible to the school and the special classes a mental clinic for the detection of the feeble-minded child and the diagnosis of his particular possibilities, capabilities and adaptabilities, a so-

cial-service department, containing workers to act as visiting teachers, keeping in touch with both child and home and a vocational and employment bureau, we have the beginnings of an effective machinery for supervising the feeble-minded in the community. The need for some properly constituted authority to take on the supervision of the feeble-minded is urgent.

4. Mental Clinics.

The creation of mental clinics throughout the state, manned by the staffs of the state hospital for the insane and the school for the feeble-minded, to act as clearing houses for the defective, the subnormal, the peculiar, and the nervous children of the public schools, the abnormal and delinquent children of the juvenile court, and the various complex mental problems in the home and in the community, will do much toward the prevention of insanity, pauperism, and criminality in the oncoming generation.

5. Laws for the Commitment of the Feeble-minded.

There should be laws containing provisions for the diagnosis, commitment, parole, and discharge of feeble-minded persons, stating who are qualified to diagnose feeble-mindedness and making the usual provisions for the protection, care, training, and segregation of mental defectives.

CUTANEOUS SENSIBILITY IN CASES OF PERIPHERAL NERVE INJURY.

(Arch. of Neur. & Psych., Nov., 1919, Stanley Cobb).

Conclusions.

1. A review of the experimental and clinical work on cutaneous sensibility indicates that the epicritic and protopathic hypothesis of head and his collaborators should be abandoned.

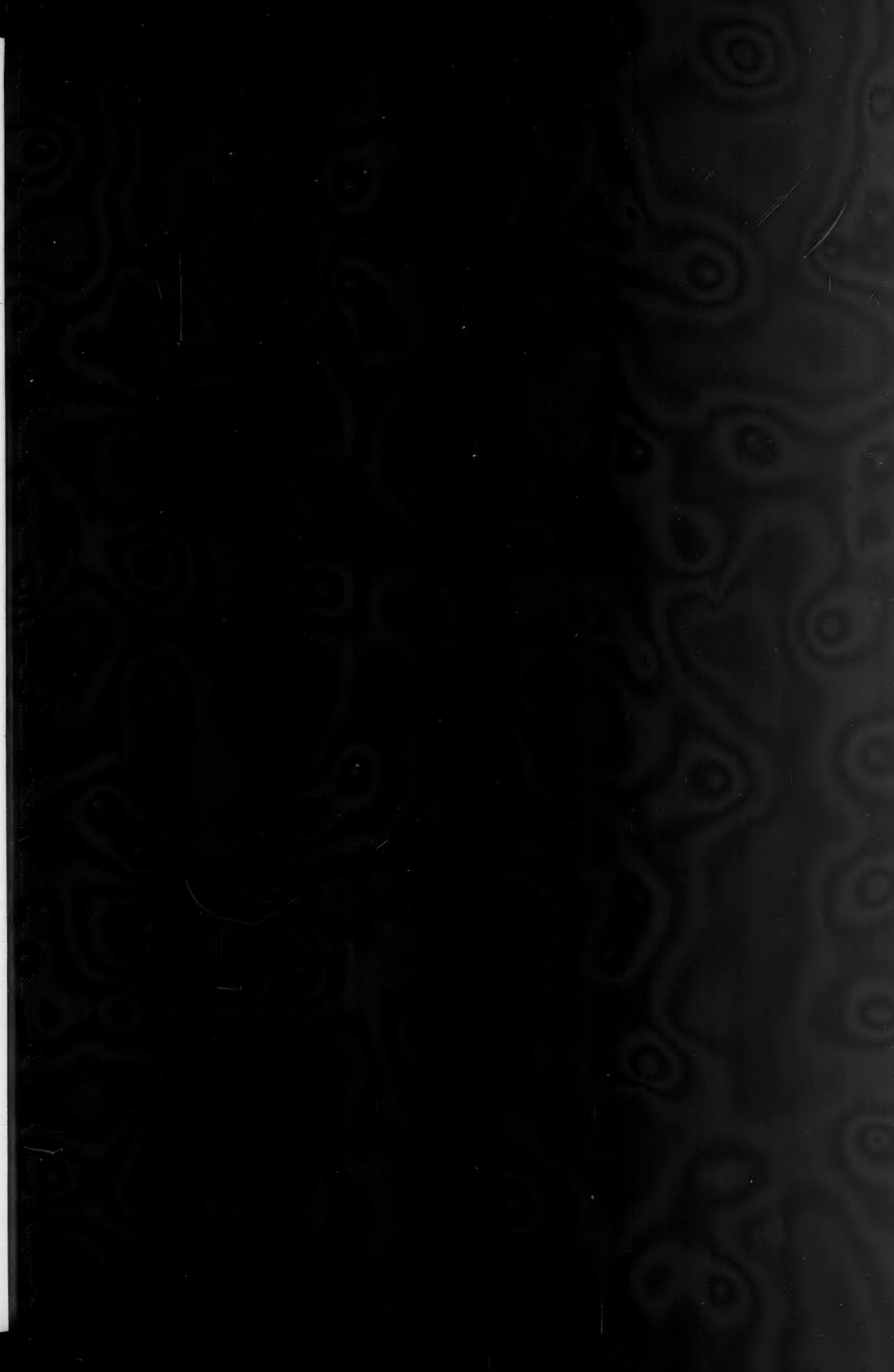
2. Dissociations of sensation due to peripheral nerve lesions arise from comparing stimuli not only qualitatively different but quantitatively unequal. In short, they are artefacts.

3. Clinical examinations should be simple and since areas of dissociated sensation in peripheral nerve lesions are shown to be due to artefact, examination for one mode of sensation suffices for diagnosis.

4. For clinical sensory examinations quantitatively standardized stimuli should be used.

5. Subcutaneous pressure is best tested with an instrument which gives the threshold values in grams.

6. Hyperalgesia may follow the course of superficial veins.



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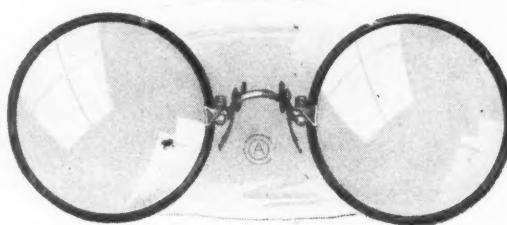
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